Food Manufacture

Incorporating Canning, Packing, and Preserving

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Pound Foolish!

A VISIT to the Rothamsted Experimental Station the other day convinced us that the majority of manufacturers are missing golden opportunities—literally speaking—by their failure to keep in close touch with the work of the Station. Much of this work has a direct practical bearing on food manufacture. There is, however, serious danger that one department of the organisation now engaged upon research highly important to the industry may suffer a breakdown from overloading and lack of fuel—in other words, the present staff and accommodation are being overstrained through inadequate financial resources. This, as every manufacturer will agree, is deplorable. It is the height of absurdity and folly to strangle research by neglect to supply the few hundreds of pounds which would enable the industry to save many thousands.

The business acumen and common sense of the average food manufacturer may be trusted to come to the rescue and lend a helping hand in this matter—more particularly in respect of the following unfortunate conditions.

Factory Effluents.

Although of normal dimensions, we found some difficulty in squeezing ourselves into the fermentation department. We were prepared for this, as someone had remarked that there might be difficulty in opening the door. But we were not prepared for the astonishing sight of scientists engaged in a game of hide-and-seek among a tangle of apparatus that should have been spread over half an acre. Here, we were informed, experiments were in progress to evolve means for the purification of effluents from milk factories. Part of the problem has already been solved on the lines of the procedure which has in this department been successfully worked out for the treatment of sugar beet effluents, which formerly resulted in the destruction of fish, and in other troubles, by production of anaerobic conditions in the streams. In the case of waste milk, attack is being centred on the splitting up of the fat ingredients by suitable bacteria. The difficulty is enhanced by the large volumes of the effluents to be dealt with—but there is every promise of these difficulties being overcome in the near future.

Those concerned with other branches of the food industry will not fail to grasp the significance of this particular research in dealing economically with fat-containing wastes in general, and this is precisely the reason why the industry as a whole should see to it that the work is not hampered by being carried out under the conditions of a Rugby scrum.

Milk Pasteurisation.

At the last meeting of the Biochemical Society, Anderson and Meanwell produced experimental evidence to show that it is not to pasteurisation (at 62·8° C. for 30 minutes) but to faulty milk production and infection from utensils that defective milk is to be ascribed. Raw milk must be clean, and likewise the utensils, which should be blown with steam under pressure for 20 minutes or until the condensate has attained a temperature of over 95° C. The speakers asserted that steam is better than disinfectants, such as chlorine. They also gave some interesting information about a new culture medium which they had found effective in revealing thermoduric bacteria hitherto generally unsuspected in pasteurised milk.

Courses in Canning.

It is interesting to note in the Annual Report of the Campden Research Station that twenty-four persons at-

tended at various times last year for short individual courses in the principles of canning. The length of the courses varied from one to four weeks, according to the amount of information required by the students. Three men attended from different parts of the Empire. It would seem that if the unique opportunities which Campden offers for training in the technical aspects of canning were more widely known, especially in overseas countries, the number of those anxious to avail themselves of these facilities would be greatly increased.

Vegetable Toughness.

It is generally accepted that the toughness of canned vegetables in general, and of peas and beans in particular, is intimately connected with the hardness of the water used in canning, and this is borne out by the results of experiments carried out at Campden. Actually the hardness of dried peas depends upon the variety, age and method of canning, but the blanching process is of particular importance, as this causes toughening of the skins and also of the flesh, on account of the absorption of the calcium salts in the water. Therefore, avoid the use of hard water, especially in blanching.

Flat Sours.

So far there does not appear to have been any serious case of flat sour spoilage of canned peas in this country, but it is as well to be on one's guard. It has been shown in America that there are three types of spore-forming thermophilic (heat-resisting) bacteria capable of producing spoilage in canned peas—namely, flat sour thermophils, thermophilic anaerobes, and sulphide spoilage bacteria. The flat sour type produce acid but no gas. The thermophilic anaerobes produce acid and gas, while the sulphide bacteria produce hydrogen sulphide — easily recognised. These questions, also, form a part of the programme of research under way at Campden.

The Gentle Art.

"Curiously enough, it is the exaggerated statement which is most quickly distributed and which finds most credence," stated Dr. Lampitt in the course of his highly interesting Presidential Address to the joint meeting of the Food Group and the Royal Sanitary Institute at the Blackpool Congress on June 21. Now and then Dr. Lampitt enjoys a little gentle "leg-pulling"—so gentle, in fact, that if it were not for the shadow of a smile which "hovers over his mobile countenance," and which we have learned to associate with the pulling process, we might be misled into taking him seriously.

In order not to be accused of wrenching a bald statement out of its context, we hasten to add that what Dr. Lampitt was driving home was that enthusiasts are somewhat prone to exaggerate, "and I think we can all agree that extravagant statements have been made regarding the dangers of the methods of distribution of many food products. Statements have been made which would not stand the cold reason of scientific investigation." That is an extremely gentlemanly way of putting it. Assuming he alluded to statements which now and then grace the front page of the daily press, we would rather not express on paper our version of what was running through his mind.

Exhibition Jazz.

We enjoyed the salty breezes of Blackpool more than the somewhat cramped and stuffy atmosphere of the Royal Sanitary Institute's Health Exhibition. There was no lack of interesting material, but it was huddled together and so jumbled up with side-shows, rifle shooting ranges, soda-fountains, and slot-machines as to "take one's eye off the ball"—so to speak. One had continually to ask oneself the question, "Is this a Winter Garden stunt, or is it a demonstration of a new health gadget?" It was impossible to arrive at a serious contemplative frame of mind so necessary in imbibing the knowledge which exhibitions ordinarily offer. Apart from this, the Congress may be safely said to have been a great success.

Short Weight.

Once again we have had a heat wave, and once more the lives of grocers and other traders in prepacked articles are being made miserable by the activities of the Inspectors of Weights and Measures. These worthy and well-meaning individuals do not seem to realise that many foodstuffs, such as flour, peas, beans, etc., contain a certain amount of natural moisture, some of which is driven off if the weather becomes very hot and dry. We referred to the same subject in July, 1931, but in view of a recent case involving peas we are ventilating the matter again.

A number of cartons of peas were weighed by an Inspector and some were found to be short weight. The Inspector agreed that it was due to evaporation, but said "they ought to make provision for it." In other words, the Inspector is recommending the trade to pack overweight to allow for possible losses owing to evaporation. This is, in the first place, illegal; and, in the second place, unreasonable. How can any packer forecast the weather? Some packages may be packed for months before they reach the ultimate consumer; and, in any case, regular packing of overweight would cost the trade

a lot of money. It should be evident to the meanest intelligence that if a packet of peas or flour has lost weight owing to evaporation the food value of the contents is unaltered. In the case of flour, more water will be taken up by the dough. The case referred to was dismissed, but the defendants' costs were refused, and thus, in spite of legal vindication, the packers were put to much expense. If the Inspectors really want to catch the wily people who are deliberately packing short weight they could do it more effectively by paying surprise visits to the packing factories and checking the scales and observing the methods used. The present procedure is most unsatisfactory, and Inspectors ought to be schooled more thoroughly in the rational interpretation of section 12, subsection 3 of the Act.

Diacetyl.

It is a pity that more time was not allowed for discussion of the excellent papers presented at the Food Group meeting on the occasion of the Annual Meeting of the Society of Chemical Industry at Newcastle on July 13. Professor Kay's paper alone, on milk and dairy products, provided enough fodder for a two-hours debate.

We can only refer to one or two points here. There was a lively little skirmish between Dr. Cox and the professor on the question of diacetyl in butter, which the latter stated is largely responsible for flavour and aroma. Dr. Cox doubted this and said he had never been able to detect diacetyl in butter.

Ten Commandments.

In Professor Armstrong's opinion, it is hopeless to attempt to popularise milk by educational methods. What is wanted is the framing of a set of ten commandments for the use of milk, so that people would be forced to consume fitting amounts of the fluid of the right quality. This is an excellent idea, provided it were strictly confined to milk. Of course, what actually would follow would be the drawing up of hundreds of sets of commandments for every other edible commodity. Somebody remarked that Professor Armstrong always hits the nail on the head, and so he does.

Whey Disposal.

Professor Kay referred to the ready disposal of whey on the farm, whereas in the factory its profitable use still remains a problem. Does not this indicate that the solution of this and similar difficulties lies in a re-grouping of the scattered fragments of the dairy industry into larger and more complete units, equipped with modern plant and under technical control, so as to secure continuity of operations from the production of the raw materials right down to the manufacture of each by-product, all under the same roof—much on the same lines as the modern packing-house? The trouble seems to be the existence of numerous small and widely scattered, semi-domestic cheese making and other dairy concerns.

English Wheat.

Dr. E. A. Fisher, of St. Albans, in an admirable paper to the Group, clearly defined the problem involved in improving the quality of home-grown wheat, and he emphasised the importance of making every endeavour to bring this about. It is only in this way that English wheat can come into consumption for bread making. Who is going to provide the funds for this urgent research? Certainly not the farmers, if past history is any guide! The brilliant Cambridge researches which produced Yeoman wheats were financed by a private milling firm.

Rabbit Shooting.

But there is a chance that the farmer may improve his ways. We are informed that the stress of economic conditions in the north-east of the country has wrought a changed attitude in the farmers there. The agricultural advisers are now being pestered for information and the farmers' sons are flocking to technical classes. If this admirable spirit continues there will be little left of the traditional conception of farming as a gentlemanly occupation affording excellent opportunities for rabbit shooting on the one hand, and a dumping ground for the village idiot on the other. The result is that while there are many highly intelligent and progressive farmers, they have hitherto been swamped by the apathy of the majority.

The Factory-Farm.

Our own opinion in the matter is that rationalisation of agriculture will come with the circumvention and absorption of the purely farming type by the establishment of what might be called the factory-farm, where the land would be cultivated under the scientific management and according to the requirements of a factory actually situated on that land and taking from it raw materials for manufacturing operations—on the analogy of the canning factory and its surrounding orchard and the factory ship and its fishing fleet.

It would seem that this present-day tendency might readily become a general movement to industrialise the entire range of farming activities, welding agriculture and manufacturing into a single, inseparable unit.

Egg Production.

The amount of research that is being carried out at the various Ministry of Agriculture Stations devoted to poultry breeding is indicated to some extent in a statement issued by the Ministry. The table poultry experiments at Wye have covered the possibility of reducing feeding costs, and though final figures are not yet available it is clear that there is a limit to feeding economies if good results are to be obtained. The investigations indicate, however, the practical possibility of halving the proportion of dry skim milk, which is the most expensive item in the fattening ration. The programmes for 1933 are designed specially for the guidance of the many producers who, for one reason or another, do not employ a crammer or who do not wish to fatten at all. These experiments include the marketing of chickens direct from their rearing quarters without any conditioning whatsoever, the disposal of birds that have only been trough fed, and the sale of chickens that have been trough fed and crammed. Particular interest attaches to the work of Professor Punnett at Cambridge. The original Gold Cambar, the first distinct breed giving sex linked results without crossing, is now being developed specially for egg production. About 200 pullets are being trapnested, and progress has been made both in winter production and in egg size and colour, the idea being to develop the breed to a reasonable standard of productiveness before releasing it for commerce. A silver variety of the Cambar has now been fixed, and it is being shown that hens of this breed can be crossed with either gold or black males for sex linkage.

Poultry Feeding.

The Millers' Mutual Association has recently published a booklet called *Practical Poultry Farming*. It is written on really practical lines and reviews modern knowledge of the most satisfactory methods of poultry management, with special regard to the problems of feeding for high egg production. The Poultry Commissioner of the Ministry of Agriculture, Mr. Percy Francis, in a foreword to the booklet, states that the value of home-produced wheat-feed, formerly known as millers' offals or middlings, as a poultry food is not yet sufficiently recognised, nor is its place in a poultry ration generally understood. All the best feeding stuffs that are most suited to fowl, with the one exception of maize, can be produced in this country, and in the case of wheat-feed the quality of the home product is higher than that of imported supplies. This higher quality is due to the fact that English millers work at a lower flour extraction than foreign millers, hence a greater portion of the endosperm of the wheat berry is found in English milled wheat-feed than in foreign middlings. The poultry keeper who uses a high proportion of home-milled wheat-feed is thus serving his own interests well and at the same time is assisting the milling industry, which has wide reactions on national well-being.

The Colorado Beetle.

The menace of the possible ravages of the Colorado beetle is well known in this country and serious enough to justify the new order (No. 558) that has just been issued by the Ministry. The order, which is called the Importation of Plants Order of 1933, came into force on July 15. It requires that living plants, including potatoes, sent from abroad for planting here must be officially certified in the country of their origin as free from any fungus, insect, or pest inimical to horticultural crops. In the old order, which is now superseded, the stipulation referred to plants with a persistent woody stem above ground; but now it applies to all classes of plants, herbaceous or woody. With all French grown plants a further certificate is required that the Colorado beetle has not been found within 200 kilometres of the place where the imported plants were grown. Importations of plants reaching this country without the necessary certificate will be held till they have been examined by the Ministry and not released until the cost of examination has been paid for. Cider apples imported between March 15 and October 14 annually are now included in the restrictions applicable to French grown plants generally. The restrictions on the importation of potatoes from U.S.A. and Canada remain in force, and a certificate is required that wart disease has not been found within 2 kilometres of the area where the plants were grown.

Lecithin in Baking.

A recent use for lecithin is its application to commercial baking. It is claimed that lecithin distinctly increases the elasticity of gluten flour and that it is possible to use 50 per cent. more water in the dough. The lecithin that has recently been put on the market for this purpose is made from the soya bean. Those responsible for its commercial exploitation state that its effect in baking is striking, as it produces an even crumb, larger volume, and a distinctly longer life in baked goods. It is recommended that a pre-mixture should be obtained from 7½ per cent. lecithin and 92½ per cent. wheat flour, and of this pre-mixture 7½ per cent. is added to the remaining flour. The total lecithin content is 0·15 per cent. It is stated that by the addition of lecithin to flour no other chemicals are necessary either for bleaching or improving. The cost of pure lecithin is 1d. per lb., so that the cost per sack of 280 lb. is just under 6d.

WHAT TROUBLES CONFECTIONERY?

The well-known consultant, R. HAROLD MORGAN, M.Sc., gives his views on various questions which are topics of the day.

THE LOW prices of sugar, cocoa, milk, and practically every raw material of the industry have led to great reductions in the selling prices of confectionery. Boiled sugar goods, toffees, and chocolates are to-day offered at prices which a comparatively short time ago appeared impossible.

It is the policy of wise manufacturers to give the public the best possible value for money. Providing these reductions in price are not made at the expense of quality and reasonable margins of profit for all concerned, the lower prices will keep up the volume of business. In spite of the present depression there are instances even where tonnage has been increased. In place of price reductions other manufacturers have contributed to the public benefit by improvements in quality, packings, etc.

The Danger Limit.

In some cases the pendulum has swung too far, and the public to-day are able to buy confectionery at prices which cannot be economically sound. Certainly these lines cannot be repeated if a slight rise takes place in raw materials. There are indications that this will take place. Also, quality in certain instances has been sacrificed in the endeavour to give a "lot for the money." Deterioration in quality introduces a grave danger. It may have the effect, unconsciously or otherwise, of spoiling the appetite of the public for confectionery. This can be a serious matter to-day when there are so many other ways of spending money.

Trade Prices.

Excessive competition has affected trade prices. There are minimum margins of profit essential to the manufacturer, wholesaler, and retailer if business is to be continued on sound lines. The number of failures in the trade shows that some members are not aware of the cost of running their businesses. At a time such as the present, accurate costing is more than ever essential.

Cutters.

The question of "cutters" has lately been very prominent. The necessity of a reasonable margin of profit and a system of accurate costing seems to be indicated by the instability of this class of trader.

The prices of advertised lines as quoted by the cutting shops have a detrimental effect on the general sale of confectionery. Not always being aware of the instability of these establishments, members of the public are inclined to question the amount of profit obtained by the legitimate suppliers. It is a human trait to buy as cheaply as possible, so the reduced prices of branded lines unduly attract attention.

Popularity of Confectionery.

Boiled goods still hold the premier place in popularity. The ease of manufacturing these lines without the necessity of expensive plant has enabled the smaller manufacturer to keep the prices down to a level which certainly does not admit of much allowance for overheads. Very few firms seem to pay sufficient attention to the art of flavouring their products. Appearance and finish certainly are big factors in an initial sale, but is it fully realised that flavour is probably the most important quality which induces the customer to buy again and again? High boiled goods, owing to temperature effects, are the most difficult to flavour; but there appears to be no reason why, in some instances, flavours have to be recognised from the labels on the bottle. Flavouring costs are comparatively low, and more attention should be paid to the use of natural extracts alone and, where necessary, to careful balance with selected synthetics.

Toffees have benefited from the low cost of milk. They

are extremely popular to-day, and remarkable values can be obtained for prices as low as 2 oz. a penny. The possibility of a rise in the milk market is seriously perturbing manufacturers of these cheap lines, and the use of dried milks is under investigation. Experiments of the writer in this direction show a promise that satisfactory results may be obtained under certain conditions.

Cheap chocolates are on the market in great quantity. Chocolate cannot be cheapened beyond a certain limit, and some of the lines are of doubtful value.

In the better quality lines new shapes, modifications of recipes, and forms of presentation are constantly appearing. Packaged goods are on the increase. It has been suggested that packets do not aid sales, as the consumer is unable to see what is inside. On the other hand, they have a distinct appeal owing to their hygienic nature. Wrapping of individual sweetmeats, which is a sound idea, is also being widely adopted. The contents of many glass bottles are now individually wrapped, and so protected from human contact or other contamination when removed for weighing and placing in bags. In the past there has been an objection to wrapping goods packed in glass on the ground that they did not show up so well. Careful selection of the wrapping material and arrangement of the pieces render the goods equally attractive.

Chocolate Dipping.

The workers are seated in Bowden Chairs, specially adapted as a result of tests carried out in the factory.

(By courtesy of J. Lyons and Co., Ltd.)

Glucose.

The advantages of glucose, and consequently confectionery, have been widely broadcast, and it is hoped that the confectionery trade will permanently benefit from this publicity. The change in attitude towards glucose has come at a time when it is possible to refute the old objection—viz., that glucose was used solely on account of cheapness. Incidentally, it seems likely that its price may now go lower.

Lecithin.

It is over three years ago since the writer, in this journal, called attention to the possibilities of lecithin in the confectionery world. In the meantime, lecithin has proved itself to be of immense value in many ways. The fluidity of chocolate can be definitely controlled by the addition of a small percentage of this substance. Fat can be saved and increased emulsification obtained. Toffees, brittles, caramels, fudges—in fact, any confection containing fat which has to intimately mix in the rest of the batch—all give markedly improved results by the addition of a little lecithin. Striking results have been obtained in other fields—*e.g.*, emulsions, flour confectionery, fat blends, etc. To quote one result from the experimental work with which the writer has been associated, the bakers' old trouble of cakes drying out too quickly can now be overcome by adding a suitable quantity of lecithin.

Machinery.

The confectionery industry is rapidly becoming fully mechanised. During recent years many of the processes, which hitherto have been regarded as possible only by experienced hand work, have been replaced by mechanical units which give large outputs of a constant high standard. With the improvements which are continually taking place it appears that the time will soon come when most lines will be turned out literally untouched by hand.

In the chocolate section machinery has assumed massive proportions. The introduction of the drier is replacing the old method of roasting. By variations in the finishing heat treatment several distinctive flavours can be obtained from the same bean. Refiners have been so improved that on the best machines a single refining only will give excellent results. New designs in tempering machines go a long way to ensure that rigid control of temperature which is so essential for satisfactory moulding and enrobing. Liquid cream centres in moulded chocolate can be obtained by a machine which carries out all the operations automatically and gives large ouptuts. Hand-rolled creams give a texture and freshness unobtainable by other methods of manufacture. The preparation of these is now being carefully studied, and there is no doubt that manufacturers will welcome and recognise the public appeal of this type of centre. The smaller manufacturer particularly will realise the advantage of being able to produce these high-class centres in an economical manner.

Utilising Waste from Juice and Jelly Making

Some Practical Hints

By JOHN ELSBURY

Apple Baggings.

THESE MAKE a good base for a cheap fruit sauce and are better than apple pulp, as they do not ferment so quickly.

Place the baggings in a pan or vat and add an amount of water to replace the juice that has been extracted. Bring to the boil and pass through a pulping machine. Return to the pan and again boil. Fill while boiling hot into a perfectly clean cask that has been made hot on a steam pipe. An addition of SO_2 may be made (½ oz. to each gallon), but if the cask is hot and the pulp is boiling when filled, there should be no need for the addition of a preservative.

It is quite a simple matter to build up a cheap sauce by starting with, say, 20 gal. of the pulped apple baggings and 20 lb. of sugar. To this might be added 10 lb. of salt and the same amount of corn starch. Onions and garlic which have been peeled and chopped fine are added in amounts determined by the particular requirements of flavour, as also are the spices, soaked overnight in water, which might advantageously include ground ginger, cinnamon, and cayenne. About 1 gal. of 80 per cent. of acetic acid and 20 gal. of water would be the amounts suitable for this mixing. The colouring is supplied by caramel. All these ingredients should be placed in a steam-pan and boiled for 15 minutes, after which the product is passed through a fine sieve and bottled hot.

Gooseberry Baggings.

These can be treated as described under Apple Baggings to make a base for a cheap fruit chutney or for a cheap raspberry and gooseberry jam, using a little liquid pectin. The gooseberries should, of course, be tipped and tailed.

The ingredients used in making quite a good, but cheap, chutney might include dried apples, lemons, onions, and preserved ginger which have been finely chopped. Sultanas also should be used and, of course, brown sugar. The flavourings might consist of white pepper and oils of cassia and pimento. About 4 gal. of a 5 per cent. solution of acetic acid to 50 lb. of pulped baggings should be used. The whole is coloured with caramel. Note that the oils should be added after the other ingredients have been boiled down to a thick paste.

Raspberry and Strawberry Baggings.

With good gooseberry pulp, these may be used for the preparation of raspberry or strawberry and gooseberry jams.

Red and Black Currant Baggings.

These may be used in the making of redcurrant and apple or blackcurrant and apple jam, with the aid of good apple pulp. The currants should be strigged; if not, they should be boiled with a little water and passed through a pulping machine.

Utilising Peel Scrap.

Small pieces of orange and lemon peel may be made use of for the production of grated peel for the baker and confectioner. Soak the peel in cold water, changing this each day, until the salt is completely leached out. Drain the peel in baskets and then immerse it in a cold syrup of 36° Baumé for 24 hours. At the end of this time draw off the syrup into a steam-pan and boil it to 25° Baumé (hot). Pour the syrup over the peel as hot as possible and allow to stand for 48 hours. Draw off the syrup into the steam-pan and boil down to 33° Baumé (hot). Again pour the syrup over the peel and allow to stand for 48 hours. Then drain well and spread on trays, which are placed in the drying room at not more than 100° to 110° F., until the peel is half dry. Mix well together, pass through a grating machine, and pack in the same way as cut peel.

THE TECHNICAL MAN

ANY employer who has, as most of them have, interviewed young men straight from school who are seeking a start in life will agree that the greatest hindrance at this critical period of their career is the complete lack of constructive suggestions on the part of the applicants. All are willing and anxious. They describe themselves as adaptable and "will do anything," whereas what every employer wants is one who, if not a specialist, is at any rate in the way of becoming a specialist, and one who at least indicates some original and constructive thought.

In a recently published book bearing the intriguing title "The Technical Man Sells His Services," Edward Hurst has fulfilled a really useful mission in indicating to young college-trained men the method of going about this extremely difficult task of finding a job. As he reiterates in his book, the securing of a means of livelihood is really a question of salesmanship, and, like all successful selling, should be tackled from the viewpoint of demonstrating his ability to make a profit for his prospective employer.

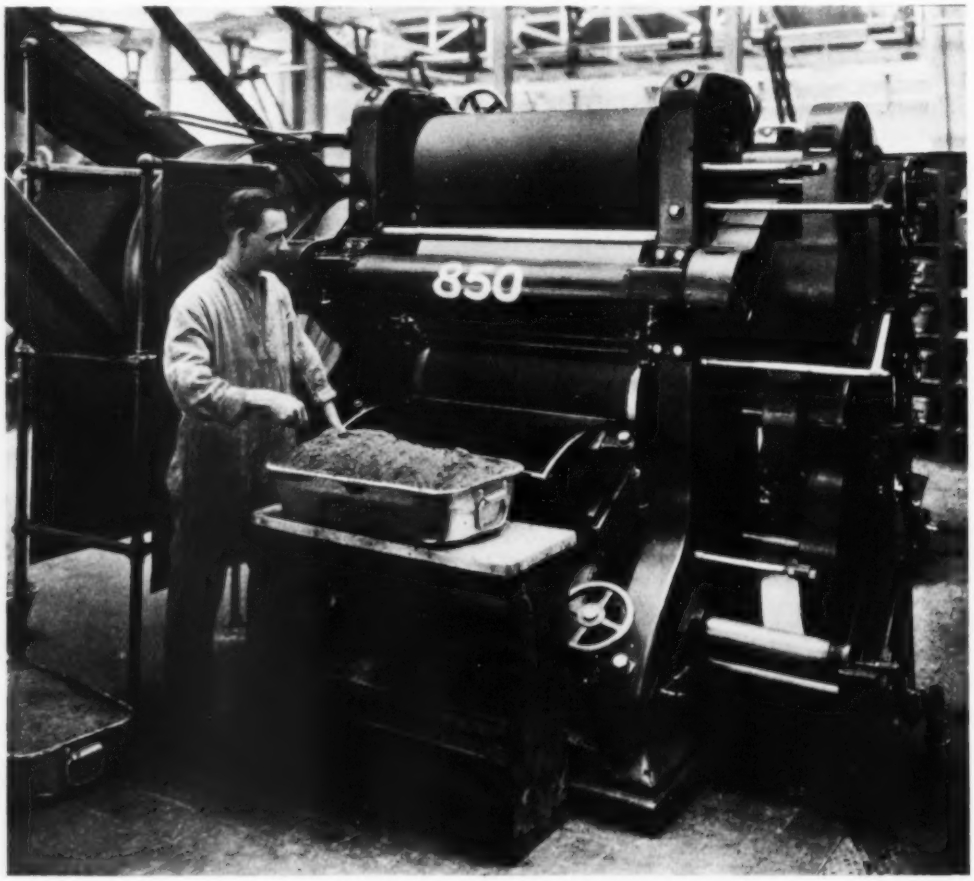
Mr. Hurst does not merely preach this theory; he proves it by reference to a series of cases, the detail and thoroughness of which cannot be too greatly praised. If every young man leaving school were obliged to read this book, there can be no doubt, in the reviewer's opinion, that at least 10 per cent. of them would "fall on their feet" right away.

W. L. H.

"The Technical Man Sells His Services," by Edward Hurst. McGraw-Hill Book Company. 239 pages, plus x Preface. Size, 8" × 5½". Price 12s. net.

AMERICAN BLIGHT

WE have recently noticed many orchards that look most unhealthy, and the leaves are curled up or else eaten away by caterpillars. In many cases the bark of the trees is white with the coating of the woolly aphis, or, as it is commonly termed, American blight. The aphis gets inside the curled leaf and is thus protected from sprays. At the Insect Laboratory, Farnham Royal, colonies of an insect that destroys the aphis have been cultivated, and we understand that small quantities are now available for people who wish to establish colonies in their own gardens and orchards.



A Chocolate Mill at Greenford.

(By courtesy of J. Lyons and Co., Ltd.)

GUMS, PASTILLES, JELLIES

Mr. N. F. Scarborough, an authority with a unique experience as a manufacturing confectioner, furnishes a brief classification of these allied lines, followed by a note on methods of production.

Detailed information on this and other confectionery subjects, including recipes and full directions, will be found in the author's book on "Sweet Manufacture," shortly to be published.

THERE ARE many widely differing kinds of sweets that can be included in one or other of the terms forming the heading to this article, but so far as production in the average factory is concerned they are all usually brought to the required finished shape by casting in starch or cornflour moulds. Hence it is generally convenient to manufacture all the varieties in one separate section of the factory, so that the same machinery may be used for moulding and, furthermore, the inevitable flying starch dust can be kept from other process work.

The many varieties of lines may be divided into five main classes, although a certain amount of overlapping will occur, depending on which of the main ingredients predominates. The five main types with the basic jellying agents are as follows:

Gelatine Goods.

The ordinary jube or pastille provides a good example of this class of work. The consistency is usually somewhat tough, depending on the amount and the quality of the gelatine present, the temperature to which the sugar and glucose mixture was boiled, and the amount of "stoving" or drying employed after casting. With crystallised work, clarity is usually not of primary importance, so that for this class of goods the gelatine may be selected for strength rather than transparency. Wine gums are frequently made with a gelatine base, and as the proportion is relatively high, it is necessary to use a grade specially selected for colour and clearness if the best results are to be obtained.

In all gelatine work there are several points to watch if consistent results are to be maintained. The correct soaking of the gelatine sheets prior to their amalgamation with the sugar boil is extremely important, and batches should be checked to ensure that the necessary quantity of water and no more has been absorbed. The sheets should be regular in thickness so that all parts will absorb water with approximately equal rapidity, and the soaking water should be kept at reasonably uniform temperatures, as the rate of absorption depends largely on this. When sheets are correctly soaked they should be removed from the tank and used without delay. Gelatine putrefies very rapidly, especially under warm, humid conditions, and objectionable flavours in the finished goods may be due to the gelatine "going bad."

Gelatine should not be mixed into the boiling syrup in the pan, otherwise overheating and loss of strength may occur. It is better practice to allow the boiling syrup to subside and to pour it over the gelatine in another container, stirring well to dissolve, and then allowing a short period of rest for the scum and impurities to rise to the surface, where they may be easily removed.

In the case of lines containing very small percentages of gelatine, good and consistent strength is very necessary. The acidulated fruit-flavoured jelly is a good example of this class of work, and it can be extremely troublesome if proper control is not exercised. All the usual precautions against graining must be taken, and difficulty in this direction can sometimes be traced to such relatively obscure causes as the vibration set up in trolleys conveying cast work by bad or uneven flooring or the use of too small trolley wheels. Stoving temperatures are important, and stoves should be so arranged that uniform drying takes place, while thermostatic control to prevent possible overheating is a very great advantage.

Gum Arabic Goods.

The good quality clear gum generally relies on gum arabic as the main ingredient apart from sugar. Commercial gum arabic varies greatly in quality, and even when it exists in large rounded lumps it generally contains quite considerable quantities of foreign matter. The most satisfactory method of cleaning the gum is to crush it and to dissolve it in approximately twice its own weight of water at as low a temperature as possible, and then to filter carefully. Gum solutions should not be boiled,

otherwise loss of both colour and strength will occur. The moulding starch for gum arabic goods should be kept very clean and dry, as perfection of surface is an important feature of this class of work.

Japanese Isinglass or Agar-agar Goods.

This material forms the base of such articles as fruit slices, orange or lemon quarters, and the paste and jelly combinations found in cream paste assortments. It gives a stiff jelly with a clean bite to the teeth and with little or no resilience. Agar-agar is not readily soluble in water, but if soaked overnight in cold water it can be readily dissolved in sugar boils. As in the case of gelatine, excessive heat rapidly reduces its strength and it should not be dissolved in boiling syrups.

Fruit Pulp and Pectin Goods.

High class imitation fruits and fruit jellies generally consist of fruit pulp with or without the addition of pectin. The base of many imitation fruits may be apricot pulp suitably coloured and flavoured. The apricot pulp should not be too ripe if the full set is desired, and overheating is also very detrimental. Where pectin is used the addition of certain amounts of acid may be necessary to develop the full set. Citric or tartaric acid solutions of definite concentrations provide an easy means of making the addition.

Starch Goods.

What are known as "boiling starches" are chiefly found in such lines as Turkish delight and a very tough variety of pastille. There are various grades known as thin or thick, and the choice depends on the work in question. Generally speaking, these starches require lengthy boiling, but they are not particularly troublesome in use. Stoving of the cast work may or may not be necessary.

Production Methods.

General production methods depend on the resources of the factory and the volume of work involved, but whatever the methods adopted the underlying principles apply. Correct boiling of sugar batches and the proper treatment of the other ingredients is just as necessary if continuous cooking machines and the latest and most up-to-date starch moulding and depositing machinery are used instead of open pan boiling, followed by hand moulding and depositing. The condition of moulding starch is very important, and it should be cleaned and dressed regularly, while additions of new starch to replace the inevitable losses should be made systematically, so that the general condition is always more or less uniform. Where possible, starch that has contained short-stoved work should be used the next time for a line that requires longer stoving, as this course assists in keeping the starch dry. Well-made work run into good, dry starch should be easy to clean, and be in a fit condition for crystallising by either the wet or the dry process with nothing more than a light brushing.

Bright work necessitates the use of steam jets to get the best possible gloss, and in the case of gelatine work especially, a light greasing with odourless vaseline will probably be required to maintain the brilliance.

A Ginger Plantation in Travancore.
(By courtesy of the High Commissioner for India.)

FRUIT PULP SQUASHES

A practical discussion of the troubles which beset the bottlers of fruit squashes.

UNTIL COMPARATIVELY recently the number of firms handling fruit pulp squash beverages could be counted on one hand. To-day, throughout the whole world, an intensive campaign would appear to be in progress with the object of establishing grapefruit, lemon, orange, limes, grape, shaddock, and tomato as strong rivals to malt and hops.

Such beverages consist essentially of the juice and the pulp of the particular fruit added to a quantity of cane sugar, and are supplied for dilution with hot, cold, or carbonated (soda) water. They are also put up by mineral water manufacturers in ready-diluted, slightly carbonated form in small bottles. It will be appreciated that the nature of the mixture makes the product readily susceptible to fermentation and consequent spoilage; hence a consideration of the methods of production, sources of supply, and modes of preservation cannot fail to be of use to those manufacturers contemplating the marketing of these beverages.

Grapefruit is the present rage. The fruit comes largely from South Africa, a " seedless " variety being the highest priced but the most prized. Palestine also is in the market for supply, but as yet in a limited way, while California is a large purveyor. The Palestine variety is somewhat deficient, relatively, in acidity, but has a splendid flavour.

Fruit v. Juices.

Much of the fruit for bottling is imported, not as fruit, but in the form of juice, and the bottler has to decide for himself whether to press the fruit himself or employ ready-pressed fruit. Naturally the former course demands the installation of special plant, and as the raw fruit costs more to transport than the juice, the saving, if any, over the second method can only be small. Again, there are the changes undergone by the fruit during shipment to be considered. Juice expressed on the spot is from fruit at its peak of perfection. Fruit may have been picked before maturation, ripening during transport being allowed for. Highly complex biochemical changes are known to take place in stored fruits, even the composition of the atmosphere of the storage chamber having an important bearing on enzyme stimulation or retardation, with consequent alteration in the character of the fruit. In the case of oranges and lemons, the particular time of pressing has an influence on the citric acid percentage of the juice —January and February Messina lemon juice, for instance, having a much higher percentage than the later samples.

Greater uniformity is usually to be obtained by making use of the ready-expressed juice. This is supplied either in preserved or sterilised form. Californian juice is almost invariably of the latter order, being supplied in sealed tins or drums. Too large containers should not be employed, it being necessary to utilise the whole contents of a single container at a time, and to bottle immediately if micro-organic infection is to be avoided.

Preservatives.

An unfortunate anomaly exists with regard to the legal preservation of such juices. Fruit pulp is allowed to be preserved with 1,500 parts per million of sulphur dioxide, while fruit juice is allowed only 350 parts per million. Some fruit juices with pulp have been considered to be of the former category, while, on other occasions, the authorities have refused to allow juices preserved with quantities only mildly in excess of the latter amount to be imported. As 700 to 800 parts per million is considered the minimum of sulphur dioxide absolutely necessary to preserve such juices, there is some danger that the juice as imported will already be in a state of fermentation. (It must be borne in mind that, however much pulp there is in the finished squash for sale to the public, it must not then contain more than 350 parts per million of SO_2, or, alternatively, 600 parts per million of benzoic acid.)

Freezing.

Another form of preservation is by freezing. In California a quick-freezing plant capable of dealing with upwards of 30,000 American gallons per day was erected

A Heavy Yield of Grapefruit in Jamaica.

(Photo. E. Wells Elliott, Kingston, Jamaica. Reproduced by courtesy of the West India Committee.)

a few years ago, it being claimed that the frozen juice may be kept over a period of years and, on thawing, will have all the properties of fresh juice.

Carbonation.

The addition of carbon dioxide has also been used, with somewhat mixed results. Its displacement of oxygen (in the form of air) tends to inhibit certain micro-organisms, but high carbonation usually leads to destruction of the delicate flavours of the juice.

Pasteurisation.

Pasteurisation has been largely employed. Its chief use, as far as the bottler is concerned, is when employing an imported juice which has been rather lightly preserved, with consequent danger of spoilage. With such fruits as tomato, pasteurisation is very effective and does not injure the flavour—in fact, it is rather an advantage from a selling standpoint in that it increases the viscosity—but when we come to the citrus fruits, the employment of temperatures high enough to destroy micro-organic cells—not to say spores, which are much more heat resisting—gives the product a cooked taste which is most undesirable.

Acid and Sugar Content.

It has been well established that the hydrogen-ion concentration in the finished product has an important influence on its keeping qualities. Some bottlers add citric acid to the juice and sugar, with considerable advantage in this respect. The amount of sugar added has also an important bearing on the question of keeping properties. While a dilute sugar syrup is very prone to fermentation, affording an almost ideal medium for the development of yeasts and moulds, a viscous sugar solution of, say, s.g. 1·330, contains so little moisture that not only is micro-organic propagation inhibited, but yeast and mould life already present, in the majority of forms, gradually dies off.

Utensils.

A study of the above factors should enable the bottler to guard against micro-organic spoilage. It cannot be

too strongly emphasised, however, that the origin of such spoilage is frequently to be traced to the use of non-sterile containers. First, the vessels used for mixing the juice and sugar need most careful sterilisation. Water rinsing, whether hot or cold, merely results in diluting the film of syrup on the side of the tank, and so affording the micro-organisms nourishment. A similar method of cleansing applied to pipes is even more surely followed by yeast, etc., infection.

Bottles.

The bottle, too, is not infrequently the key of the spoilage problem. New bottles are usually employed for squashes, and the cleansing is sometimes rather perfunctory on that account. Personally, the writer has found new bottles as a rule more difficult to deal with than bottles which have already seen service. Some time ago the suggestion was made at a bottle manufacturers' conference that steps should be taken to formulate means whereby the sterile bottles taken from the bottle *making* machines would *remain* sterile, but up to now the producer must depend on the efficacy of his bottle washing plant.

In bottle cleansing for fruit squashes the essentials are: Sterilisation by soaking in caustic solution of sufficient concentration and temperature; complete removal of all traces of the soaking alkali; sufficient friction to remove all foreign matter, hard film, etc.; and final rinse water of undoubted purity. Either a thoroughly wet bottle straight from the rinser or a thoroughly dry bottle should be employed. Such troubles as mycodermic film are usually associated with partially dried vessels. The drying should be rapid, however, a combined washing and drying machine being preferably employed.

Other Spoilage Troubles.

In addition to micro-organic spoilage there are other troubles, notably the following:

1. Clumping of the pulp.
2. Darkening of the product.
3. Colour separation.

Clumping is unsightly in the finished product, and in a narrow-necked bottle makes pouring difficult. It is more prone to occur in a product of low density. The addition of colloidal substances, such as gelatine or gum, is sometimes recommended as a preventative. The writer does not favour their use, as suggestive of adulteration. Nor are they really effective. The best preventative of clumping is a sufficiently dense (by addition of sugar) product. Lack of uniformity of product arises through clumping of the juice in the original containers or in the vessels from which the squash syrup is being drawn. An electric mixing paddle should be operated in the tank the whole time bottling is proceeding to ensure uniformity of dispersion. Large, narrow-necked containers for the raw juice should be avoided, as, if the pulp clumps, one batch may contain too much and another batch too little pulp. Some of the brands of Californian juice are now marketed in small cans, it being claimed that the smaller size prevents the separation out of the pulp.

Darkening of the product is a serious matter in the case of the citrus fruits. Oxidation has some effect, but the prime cause is the action of the proteins or their decomposition products, the amino acids, on the sugar, particularly if heat is employed. Sulphur dioxide has been found to have a considerable retarding action in this respect and, for that reason, should be employed as a preserving agent in preference to benzoic acid. Storage at high temperatures is also a frequent cause of darkening, but the possible use of a very hard water in making the sugar syrup by the hot process and consequent formation of caramelisation products should not be overlooked.

Where coal-tar colours are used, the employment of an unsuitable blend may result in the colour separating out on the shreds of pulp.

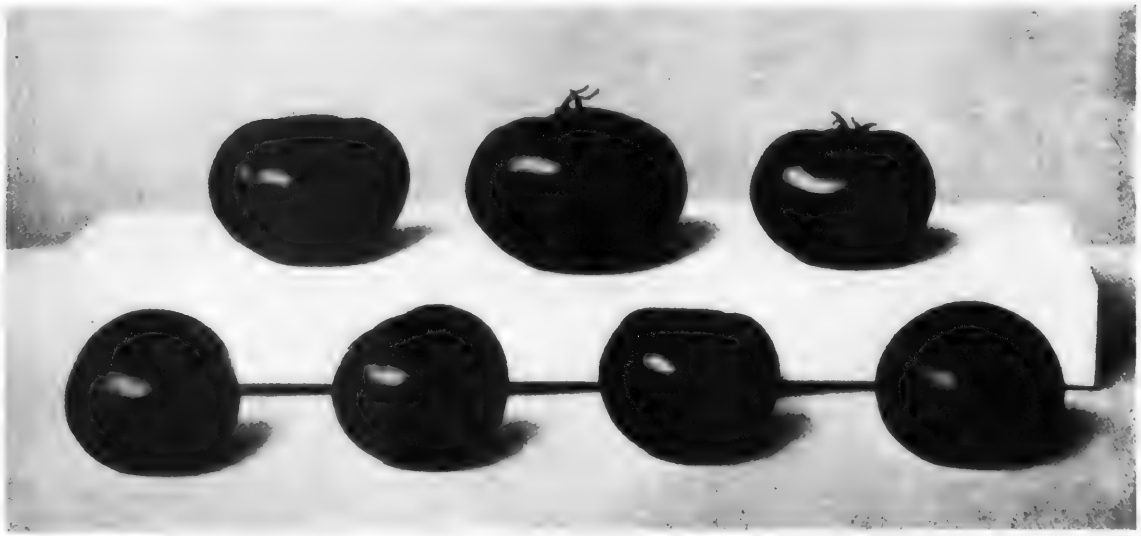
Where the trade is comparatively small, ready-made concentrates and syrups may be employed. Adulteration of grapefruit samples is not unknown, the most common being the admixture with the cheaper lemon juice. Other concentrates owe their cloudiness to gum and their strength to added alcoholic extracts.

Whether the present boom is more than a passing fad remains to be seen. The squashes have real food value and therapeutic recommendations. Citric acid preserves the alkaline balance of the blood, and is found in the citrus fruits. Tartaric acid, the natural acid of the grape, is claimed to have distinctive digestive properties. Lime, orange, lemon, and grapefruit are all more or less rich in vitamin C, although some care must be taken in processing lest this be destroyed. In calorific value the grape heads the list with 450 per lb., as compared with 240 for oranges. The addition of cane sugar, of course, as is usual in the finished product, greatly increases the heat unit value.

CRYSTALS IN SALMON

A CURIOUS occurrence of crystals of magnesium ammonium phosphate (struvite) has occasionally been observed in canned salmon. Mr. C. H. Manley, City Analyst for Leeds, sought the opinion of a physiologist as to their probable origin. The latter suggested that local decomposition, not necessarily of a harmful character, may have provoked the formation of the crystals, and stated that microscopic crystals of the salt are sometimes found under abnormal conditions in the human digestive tract.

TOMATO CATSUP



An Expert Account of Manufacturing Methods in the U.S.A.

TOMATO CATSUP or ketchup is undoubtedly the most popular of all condiments in the United States. The value of the catsup packed exceeds $20,000,000 annually, and its manufacture is widely distributed wherever the tomato can be economically grown. California, Utah, Indiana, Ohio, Pennsylvania, Maryland, Virginia, all supply considerable quantities. One of the largest catsup packing plants in the world is situated in the province of Ontario, supplying catsup to England and the Empire countries as well as Canada.

Raw Material.

The first essential for the manufacture of high-quality tomato catsup is an adequate supply of ripe, red-coloured tomatoes. Catsup can be, and frequently is, made from canned tomato pulp or purée, but the resulting product does not compare favourably in colour or flavour with that made from fresh tomatoes. A properly made bottle of catsup with a good hermetic seal will retain its colour and tomato flavour better than a can of tomato pulp.

Catsup packing plants are always located in regions where fresh tomatoes can be delivered within 24 hours of picking. The tomatoes are usually delivered in baskets holding about $\frac{1}{2}$ to $\frac{5}{8}$ of a bushel (containing from 25 to 35 lb. of tomatoes) or in boxes holding 50 to 60 lb., and should be subjected to the minimum of handling before arrival at the factory. As with canned tomatoes, buying on grade is now the preferred practice. For catsup, smaller tomatoes of the necessary colour and freedom from blemishes can be classified as U.S. No. 1 than is the case with tomatoes for canning.

The first step in the manufacture is washing, followed by trimming and sorting. These operations are carried out on the same system as that employed for the manufacture of tomato purée, as described in the October issue of FOOD MANUFACTURE. In general, greater care is taken in the sorting and trimming of tomatoes for catsup than is the practice for purée, as the finished product is displayed in a glass bottle, and any carelessness in the elimination of green or unripe tomatoes is reflected in the colour of the catsup. The addition of artificial colour, whether carmine or permitted aniline dyes, is prohibited without declaration on the label, and, as with most food products in the United States, a statement that added colour is present carries a suggestion of an inferior product to the consuming public; and this fact has undoubtedly encouraged manufacturers to devise methods to obtain a better colour in the raw material and develop processes to retain this colour as far as possible.

Pre-treatment.

After trimming, the tomatoes may be subjected to various treatments according to the type of catsup desired. The handling of the tomatoes at this stage will determine very largely the consistency of the finished product. Most manufacturers of high-quality catsup desire a good body and heavy consistency, which will more or less "stand up" when poured out of the bottle and will not break down at the edges with a separation of watery fluid. Some years ago it was customary for some manufacturers to use the "blotter test" as a demonstration of the superior quality of their catsup as com-

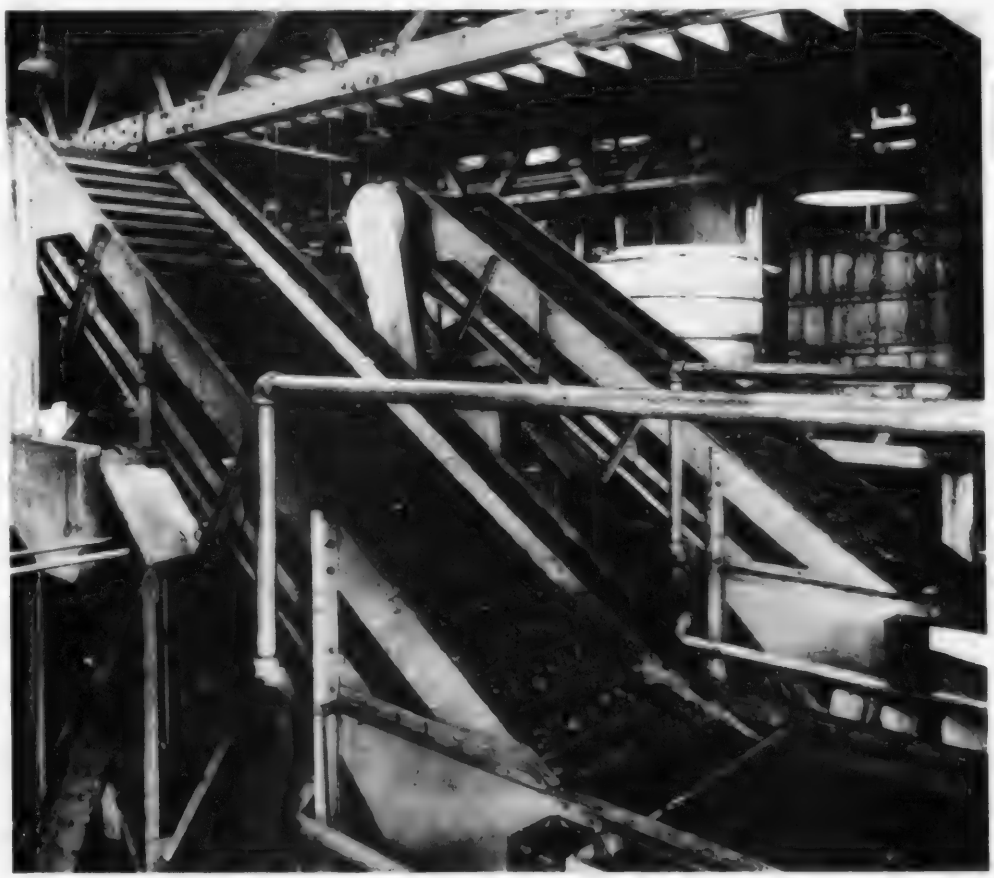
pared with competitive brands. If spots of tomato catsup are placed on a piece of blotting paper (filter paper will do), it will be noticed that very shortly a ring forms around the catsup, varying in extent and rapidity of development with the brand of catsup. It was claimed by the salesman making the test that the presence of this ring indicated an inferior, watery catsup, low in tomato content as compared with a catsup showing no ring. As a matter of fact, a catsup may be abnormally high in tomato solids but yet show a poor blotter test, depending on the treatment of the tomatoes before pulping. It is also possible to produce a catsup of good blotter test by the addition of thickeners, such as pectin or gum, but this practice is, of course, illegal in the eyes of the Food and Drug Administration, which defines catsup as the clean, sound product made from properly prepared pulp of clean, sound, fresh, ripe tomatoes with spices and with or without sugar and vinegar.

Although the blotter test is an unfair test for the proportion of tomatoes present in a catsup, yet there is undoubtedly a public demand for a catsup with a body and consistency which shows up well in this test, and most manufacturers of high-class catsup have adopted methods which will give this desirable consistency or water-holding capacity.

Scalding or Cold Break.

As this process calls for more complicated equipment and methods many manufacturers, particularly of the cheaper grades, use the simplest procedure, known as the "cold break" method. The tomatoes, after sorting and trimming, are conveyed on a metal mesh belt through a scalder, in which the tomatoes are subjected to live steam for a short period up to a minute or two in duration, with the object of loosening-up the skin and assisting in the extraction of colour and soluble material from under the skin. The steamed tomatoes then pass through a pulping machine or "cyclone," which is a cylindrical, perforated metal screen (preferably of Monel metal, but more usually of copper). The tomato juice and pulp are forced through the screen by paddles revolving at high speed, while the skins, seeds, and coarse fibrous portions are thrown out as waste. From here the juice is pumped to the evaporators and made into catsup, as will be described later.

Some manufacturers claim that a better product is made by crushing or chopping the tomatoes before cycloning. Others prolong the scalding process with the object of extracting pectinous material from the tomato and of gummy material from the flesh surrounding the seeds.



Elevator Washer for Tomatoes.

Hot Break.

Many manufacturers producing a heavy body catsup use a variation of the "hot break" process. By this system the tomatoes, after trimming, are collected in cypress vats or tanks and rapidly heated by means of live steam or steam coils. In some instances this heating is only continued until the pulpy mass almost reaches the boiling-point, whereas in others it is continued for 30 or 40 minutes before the hot, pulped tomatoes pass through the cyclone.

The theory underlying the hot break principle is that, in addition to more efficient extraction of pectinous materials due to the higher temperatures (cold break cyclone juice, even with prolonged scalding, will rarely rise above 130° F., whereas hot break juice may be 190° or higher), the enzymes which cause rapid breaking down of the pectin in cold extracted juice are destroyed by the higher temperatures. Very careful trimming of tomatoes is necessary for hot break catsup, as the preheating will extract undesirable flavours from unripe or blemished fruit which will not be the case with cold extracted juice. It is also claimed that the preheating will impair the colour of the finished product. Both systems have their advocates, and catsups made by cold or hot break processes find a market, so it is up to the manufacturer to determine which process suits him best.

Boiling.

The other ingredients which are blended with the tomato juice or pulp are added in the evaporator, which is usually of the same type as that employed for purée, glass-lined equipment being used more frequently than in purée making. Some manufacturers prefer to do the actual boiling or concentrating of the catsup in comparatively small batches in tinned copper or nickel kettles of 50 to 100 gallon capacity, claiming that less loss of colour and flavour takes place than in the 1,000 gallon tanks.

The principal ingredients, apart from tomatoes, are vinegar, sugar, salt, onions, garlic, and spices. The vinegar is added principally for its preservative effect and to counteract the sweet taste of the added sugar. Some very interesting work has been done at the New York Agricultural Experiment Station on the preservative action of sugar, salt, and vinegar in tomato catsups. It was found that about 1 per cent. of acetic acid was necessary to prevent spoilage in the absence of sugar and salt, but this amount of acid could be materially reduced by the addition of sugar and salt; with 3 per cent. of salt (which is approximately the salt content of most commercial catsup) and 15 per cent. of added sugar, as low as 0·3 per cent. of acetic acid will be satisfactory in preservative effect. Most good grade catsup will contain from 0·7 to 1·0 per cent. of acetic acid in the finished product, with from 15 to 25 per cent. of added sugar.

The tomato juice is concentrated to approximately one-third of its original volume during the process of manufacture, the amount of vinegar added being from 3 to 5 gallons for each 100 gallons of "cyclone" juice, with from 40 to 60 lb. of sugar and 8 to 10 lb. of salt, depending on the flavour desired. Some catsups have relatively small amounts of added sugar, and these are usually highly spiced; the sweeter types with about 20 per cent. of added sugar and a high specific gravity and mild flavour are more popular at the present time. One hundred grain spirit vinegar (containing 10 per cent. of acetic acid) is used and is generally added about 5 minutes before the end of the boil to prevent excessive losses due to evaporation. The salt is added at the same time, as it is claimed that salt will "bleach" the tomato colour if added earlier. Most of the sugar is also added towards the end to prevent caramelisation, although a portion is added earlier, as this is found to "fix" or help maintain the colour. The other added ingredients are onions, garlic, and spices. The amount of onions and garlic added depends on taste, and is usually about 5 lb. of chopped onions and 2 to 4 oz. of chopped garlic to each 100 gallons of juice.

Spices.

The selection of spices and method of using them varies according to the taste of the manufacturer. The most usual spices are saigon cassia, cloves, allspice (pimento), mace, ginger, and cayenne pepper. The spices should be selected on the basis of flavour except that headless cloves are used, as the heads contain more tannin, which is liable to cause darkening of the catsup. Paprika is frequently employed to enhance the red colour without adding very much flavour. Ground spices are not advisable (except with cayenne and paprika) as they cause darkening and produce a bitter taste. The whole spices are generally placed in a bag which is suspended in the juice at the beginning of the evaporation and removed at the end, sometimes being extracted in a second batch. Greater uniformity is probably obtained by extracting the spices in vinegar in a separate tank and adding a definite volume of spice extract to each batch of catsup. Recently essential oils of the various spices have come into favour, dissolved in acetic acid or mixed with sugar or salt and added at the end of the process. This is claimed to eliminate the tannins always present when whole spices are used, and thereby reduce the danger of darkening the catsup. It is doubtful, however, if the flavour obtained with essential oils is as full bodied as that obtained with the whole spices, but this is, of course, a question for each manufacturer to decide for his own product.

Finishing.

It is important in making catsup to have the steam coils (carrying steam at 100 to 120 lb. pressure) properly trapped and arranged so that the condensed steam can be rapidly drained from the coils, otherwise excessive "burning" of the catsup in the coils will result—which may slow down the rate of evaporation, so that a batch usually requiring 40 minutes to finish will take as long as 90 minutes. Green tomatoes will also cause burning on the coils. It is necessary to clean the coils thoroughly

A Sorting Belt.

after every batch to obtain rapid cooking, which is, of course, essential if the best possible colour and flavour are desired.

The best way to determine the finishing point in catsup is probably to boil down to a definite volume as measured by a specially designed and calibrated gauge stick. Catsup being a condiment is judged largely by flavour, colour, and general appearance, and the specific gravity and solid content are chiefly important in so far as they affect the consistency.

As it is convenient to use definite amounts of spices, sugar, onions, etc., for each batch, the object of the manufacturer is to finish each batch at a definite volume and then adjust the amount of juice or tomatoes used so that the catsup will have the desired consistency, specific gravity, and solid content. Most manufacturers of high-class catsup use a simple viscosity test of some kind in conjunction with a rapid test for specific gravity or soluble solids as described in the manufacture of purée.

From the results of these tests, combined with a knowledge of the characteristics of the pulped tomato juice, the proportion of tomatoes to be used in succeeding batches is worked out. When the end point is reached the catsup is passed through a finishing machine similar to a cyclone, but with finer perforations in the screen, and is collected in a holding tank before filling into bottles. In some instances a shaking screen is used instead of a finisher, as it is claimed that this produces less breaking up of the fibres, thereby producing a better consistency, and results in less inclusion of air in the finished product. Brush finishers with conical screens are also used in place of the ordinary cylindrical paddle finishers.

Filling.

High-speed rotary filling machines are used in which the catsup is filled into rinsed, preheated bottles at a rate of up to 100 bottles per minute, the filling machine discharging directly on to an automatic capping or sealing machine. Goldy seals or crown caps are most generally used, with a composition cork lining sometimes faced with a tin spot where the seal comes in contact with the catsup.

Pasteurisation of the catsup is not necessary if the filling temperature is 175° or higher, although sometimes it is resorted to as a safeguard in case of breakdowns, which may result in cooling of the catsup before sealing. Rapid cooling of the filled bottles is desirable to retain the colour and flavour as far as possible. The cooled catsup is usually stacked in bulk until ready for labelling, which is often carried out by machine, although hand labelling is still employed, particularly as the peculiar design of many catsup bottles offers quite a problem for the labelling machine to handle satisfactorily.

Spoilage.

Spoilage in catsup due to fermentation or bacterial decomposition is comparatively rare nowadays. Most of the organisms responsible for this type of spoilage are destroyed in a few minutes at 170° F. in an acid medium such as catsup, and at 180° death is almost instantaneous. Manufacturers rely on proper selection of tomatoes, together with efficient sorting and trimming and maintenance of sanitary conditions throughout the plant and equipment, to keep the contamination from these organisms as low as possible, and ensure satisfactory keeping

properties by filling and sealing at temperatures above 180°. At one time benzoate of soda was largely used, particularly by manufacturers of lower grades of catsup, frequently in conjunction with dubious tomatoes, or to preserve catsup made under insanitary conditions, but nowadays, although benzoate may be used if its presence is admitted on the label, no reputable manufacturer would employ it in catsup.

Mould Count.

The efforts of the Department of Agriculture, aided by the responsible manufacturers, have undoubtedly contributed to the development of sanitary and efficient methods of handling and manufacture. By careful and detailed study of tomatoes in various stages of decay, a standardised microscopical examination of the finished product has been worked out which correlates the number of mould filaments, yeasts and spores and bacteria as observed by the official methods of examination with the condition of the tomatoes used. Catsup which fails to comply with the official specification for moulds, yeast, and bacteria count is liable to condemnation as unfit for food. High counts have been shown to be due to excessive delay in handling tomatoes, thereby allowing mould growth or bacterial spoilage to commence or else to insufficient care in cleaning equipment. Although this microscopical examination has frequently been subjected to criticism, there is no doubt that the application of this method of inspection has led to the adoption of better manufacturing technique, and careful manufacturers experience no difficulty in keeping within the official limits. So long as the original bottle is unopened the possibility of spoilage depends largely on the initial degree of contamination and on the sealing temperature (assuming, of course, a satisfactory hermetic seal which does not develop a leak). After opening, the keeping properties will depend on the proper relation of acetic acid, sugar, and salt; many combinations are possible which will be satisfactory. Most catsup manufacturers have developed, by experience or design, formulæ giving analytical figures as outlined above. It should be remembered that the total acidity determined by direct titration will be considerably higher than the acetic acid content, as the tomatoes contain about ½ of 1 per cent. of citric acid, which will contribute to the acidity of the final product according to the degree of concentration. Catsup will therefore keep for several weeks after opening, and usually "dries up" before spoiling, particularly if care is taken to prevent access of air and foreign matter, by replacing the outer screw cap usually provided in addition to the inner sealing crown or goldy seal.

Black Neck.

Deterioration of catsup apart from actual spoilage may take place in various ways. "Black neck," or the appearance of a dark discoloration at the surface of the catsup is a frequent source of trouble. This appears to be due to the development of an iron-tannin oxidation compound in the presence of air. For this reason every effort is made to avoid contamination with iron during manufacture and to keep the tannin content low by selection of spices or use of essential oils. At one time the penetration of the catsup through the cork liner and subsequent corrosion of the tinned iron cap with the solution of iron was a common cause of dark neck, but with the use of aluminium seals and the development of impervious composition cork liners with tin caps, this source of trouble was eliminated, and nowadays "black neck" is experienced only when the seal fails and air actually gains access to the catsup. Leaks may occur through defects in the glass or in the sealing medium, frequently through "drying out" of the cork composition. For this reason manufacturers frequently store the bottles in bulk on their sides to prevent drying out of the cork and to enable adequate inspection of the catsup to be made before labelling. Another form of spoilage indicated by the presence of black streaks in the catsup is due to bacterial spoilage generally indicative of too low a sealing temperature.

Separation.

Separation will sometimes take place in the catsup. A watery layer at the surface indicates insufficient tomato content or insufficient extraction of pectin from the tomatoes used. A watery layer at the bottom of the bottle is usually caused by excess air trapped in the thick pulp which apparently is not drawn out by the vacuum induced when the bottle cools down. This type of separation can generally be overcome by shaking the bottle.

Tomato Content.

So far no official standard for tomato content has been adopted, and the degree of concentration, so far as tomatoes go, of various brands of catsup depends on the taste of the manufacturer or the price of the finished product. It has been suggested that a minimum tomato solid content of 12 per cent. be adopted, which would represent a production of about 1 gallon of catsup from 2 gallons of juice and represents roughly the concentration used in high-grade catsups. It would be difficult to enforce this standard until methods for the analytical determination of the tomato solid content have been more fully worked out.

Catsup from Purée.

In the manufacture of catsup from tomato purée, the evaporation and bottling follow the same lines as for catsup from fresh tomatoes, except that as the time of boiling is necessarily shorter the spices are usually added in the form of a vinegar extract. In addition to resulting in an inferior product, the manufacture of catsup from pulp or purée is expensive owing to the cost of the cans, which are necessarily wasted, and for these reasons most catsup is made from fresh tomatoes, affording an interesting study of the application of scientific methods of handling and manufacture to the production of a household article.

BRITISH CANNING

We have received the following comments on James D. Vassie's article published in last month's issue, which critically examined the strong and weak features of the British Canning Industry. The subject is still open for further discussion. Mr. Vassie's reply will be published next month.

Mr. J. W. Black.

MR. J. W. BLACK, B.Sc., A.I.C., has some critical and constructive suggestions to make:

"The questions propounded by Mr. Vassie in his article in your issue for July are much to the fore at present and his paper is particularly timely.

"For some obscure reason the present writer had an impression that Mr. Vassie's conclusions might be different from what they are, and prepared to read the paper in a particularly careful, not to say over-critical, manner.

"It was therefore all the more gratifying to find that Mr. Vassie's views, supported as they are by an acute analysis of adequate data and statistics, and reinforced by sound reasoning, are in conformity with his own, and are based on considerations similar in character if much less specific in detail.

"Attention should be given, however, not only to the reassuring part of the paper under discussion, but also and equally to the warnings stated or implied therein. The canning industry faces difficulties which are largely the outcome of its outstanding success during the past few years. Every effort has been made to extend and develop the actual process of canning, and it is to be feared that certain allied factors were not adequately considered at the same time. The shadow of these difficulties began to appear at least two or three years ago, when it was evident that a farseeing as well as a hopeful view had to be taken.

"Industrial statesmanship is now an urgent necessity if the canning industry is to proceed in a steady and healthy way to the conquest of these large and legitimate markets which, as Mr. Vassie shows, are adequate to support a much greater British industry than exists to-day.

"It would seem to be clear that in future, so far as the British canning industry is to be stimulated and directed by other than private interest, this stimulus and direction should be in the hands of a body representing the canning industry and no other. It does not matter whether the National Food Canning Council take this form or whether these powers are wielded by a development committee or "advisory economic council" within the Council, provided this principle is maintained.

"The duties and responsibilities of such a development council would be so numerous and varied that no enumeration will be attempted here, but the following points may be noted:

"The committee would try to obtain unity of action throughout the field of common interests which Mr. Vassie mentions, instancing the American experience in the matter. In an article on a similar subject in one of your contemporaries, Colonel Heckstall-Smith emphasises the same point and provides a valuable list of some of the more outstanding of these common interests. At the same time, each separate enterprise has its own special interests, and there is a converse to the foregoing idea that could well be borne in mind.

"The canning industry has interests in common with the tin-plate industry, the tin-container manufacturers, the machinery makers, the lacquer manufacturers, etc. It does not follow that what is in the interest—the immediate interest—of each or all of these allied trades is in the interest of the canning industry.

"The opposite may be the case, and efforts to make the canning industry outgrow its strength in the interest of another industry must ultimately be to the disadvantage of both. The canning industry must come first with the canners.

"Among the major problems facing an expanding canning industry is the adequate supply of raw materials. Stable conditions between grower and canner is the first of the positive conclusions with which Mr. Vassie ends his article. Towards this desirable end the canners, through their representative body, might link up their requirements with those of other fruit buyers and consumers, such as jam makers and those who supply the fresh fruit market. It seems possible that this would broaden the basis of contracts and provide greater security and greater reward for the grower.

"The question of the distribution of technical and scientific information might be considered. In this age an increasing number of people seem consciously to expect something for nothing, and many of them seem to get it. As a matter of fact, however, everything has to be paid for sometime by someone, and it is surely the healthiest social condition when the one who gets the article pays the price. Nevertheless, through numerous research associations, the activities of the Department of Scientific and Industrial Research and its subsidiary committees,

and the columns of the technical and trade Press, a vast amount of valuable information is available at reasonable or negligible cost to those who are competent to make use of it.

"The present writer does not desire to discuss here all that is good in this system or what may appear to be less desirable, but only to suggest that so far as instruction in canning is provided through or under the auspices of the National Food Canning Council, this should be done through agencies under the influence or guidance of the development committee or whatever body within or without the National Council guides the destinies of the industry in the near future. This would provide some check on sectional or ill-considered schemes, and perhaps induce some to seek the guidance of a development committee on plans yet to be projected. Of course, no check could or should be placed in the path of private enterprise prepared not only to provide the necessary capital, but also to provide and rely on its own sources of technical and scientific advice.

"In conclusion, it might profitably be remembered that the British canning industry is not solely a fruit and vegetable canning industry, though these interests have been most prominent lately. The industry should try to promote co-ordination of the efforts of such educative and research associations as are dealing with the problems affecting all kinds of canning. Much trouble, duplication, and overlapping might thus be saved.

"No attempt has been made in these observations to follow the order of Mr. Vassie's article or specially to comment on all his points. The writer has indicated his agreement with Mr. Vassie's general outlook and has rather endeavoured to add just such ideas as have formed in his own mind through association with recent canning history and practice. Many other problems, such as a calculated over-importation of foreign competitive packs, will suggest themselves to others. But if British canning allies the enthusiasm and optimism which have carried it so far with a calm survey of its present difficulties it may be assured of expansion and prosperity in these legitimate markets at home and abroad which are its proper heritage."

Mr. H. V. Taylor.

Mr. H. V. Taylor, of the Ministry of Agriculture and Fisheries, writes as follows:

"I have read the article by Mr. Vassie and I feel he is quite right when he says that the conditions should be made right for the supplies of raw material to be developed, and also that the canner must support any factor leading to the greater stability in the supply of raw material. It is equally wise when he says that under present conditions this seems to be a basis obtained through individual contracts of a long-term nature between grower and canner.

"The fruit and vegetables as grown in England have many outlets, and can only be really secured for the factories on a contract system, and until this is achieved the stability of the industry cannot be assured."

Mr. G. Long.

The opinions expressed by Mr. G. Long, the managing director of J. Long, Ltd., of Whitchurch, are as follows:

"Your contributor is accurate in his statement that in 1932 there was a very serious increase in the cost of nearly all British canned fruits. He might also have added that as a result of this a considerable proportion of the pack was not sold, and the carry-over was disposed of at the end of the season at less than cost price.

"It is also a fact that the American and Colonial canner was able to buy fruits much cheaper than the home manufacturer last year. I do not know how the prices will be this season, but I took a motor drive through the Ontario fruit district in June, 1933, and the prospects appeared good.

"The British canner is suffering mainly from an unwise fiscal policy. English fruits have risen greatly in price, because of the protective tariff imposed on foreign fruit to help our fruit growers, but foreign canned fruit pays only a negligible tariff, or nothing at all, and the enormous Empire production comes in free.

"Last year canning apricots could be purchased in South Africa at prices ranging from £3 to £5 per ton, delivered works, while British manufacturers were paying over £30 per ton, f.o.r., for Victoria plums. I am informed that some American canners paid a smaller price *per ton* for their canning apples than English makers paid *per cwt.*

"This is an impossible position; either the British canner must have fruit as cheap as his foreign rivals or there must be a sufficient tariff on all imported canned fruits to level things up, and in any case it is vital that the *retail* selling price should not be raised too high, or the public demand will be destroyed."

Mr. A. Ll. Matthison.

Finally, Mr. A. Ll. Matthison, director of Arthur Holden and Sons, Ltd., Birmingham, has subjected the article to his usual close analysis and has some interesting remarks to make.

"I have read with interest the article by Mr. James D. Vassie which appears in the July issue of FOOD MANUFACTURE.

"It is very comprehensive, and covers most of the factors present in the canning industry to-day.

"I think that, generally speaking, Mr. Vassie's conclusions are sound, but I submit that the figures given in Table 2, 'Output of Canned Foodstuffs,' are not sufficiently clear. Nothing is said as to the imports and exports with other countries, particularly the Dominions. I think it is very important that the possibility of inter-trade between the Dominions and the home country should be examined thoroughly. All other things being equal, preference should most certainly be given to the Dominions for fruits and other products which are not products of this country. Among these I might enumerate grapefruit, apricots, peaches, and pineapple, all of which can be obtained from our own Dominions.

"It will be a surprise to most of us to learn from Mr.

Vassie that 50 per cent. of the total output in Great Britain consists of meat products, and only 8 per cent. fruits.

"Surely there is something wrong here in Mr. Vassie's figures?

"It is agreed that the advance in canning in this country, comparing output per head of population, has been much greater during the past few years than in America. It looked, at one time, as if this rapid growth would not be a sign of healthy development, and it is perhaps all to the good that this year's output in Great Britain will probably not exceed that of 1932.

"There is always a danger, when an industry expands too rapidly, of certain undesirable elements entering into it, from no other motive than the hope of picking up something for nothing. Much hard work, considerable thought, and a fair amount of money have been contributed by what I venture to call the genuine interests in the industry. It would be a thousand pities if the financier or stock gambler secured any appreciable position amongst the little band of pioneers.

"There is certainly considerable room for expansion, but it is to be hoped that the expansion will be gradual and sound.

"Co-operation between grower, canner, and seller is undoubtedly essential, and they should, I suggest, look at their interests from a co-operative point of view rather than from the narrow one of self-advance.

"In this suggestion I am in agreement with Mr. Vassie when he suggests that 'scientific development along sound lines is only possible if preference is made for those interests which are common to the industry, or a particular section of it, as a whole.'

"This is being done to a very considerable extent through the work of both the Campden Fruit and Vegetable Preservation Research Station, and the Food Manufacturers' Federation.

"Mr. Vassie does not make any comment on this point, and the whole of his article might cause anyone not directly concerned with the canning industry to form the opinion that it was in a very unorganised condition.

"Mr. Vassie, again, has apparently not heard of the work of the Canning Council, or of the Annual Convention and Exhibition held under its auspices.

"Still another omission in his article is want of reference to the provision of a sound and reliable container on mass production lines which has been so successfully accomplished in this country. There are certainly no 'weaknesses,' as far as canning, can making, and can making machinery are concerned.

"From observations made during a recent visit to the States I feel confident that the British canner and can maker have nothing to learn from their American friends, although the happy state of affairs exists in which American and British can makers are able to discuss problems common to their work.

"Personally, I think the future of canning in this country is extremely satisfactory, but I hope this growth will be steady and not phenomenal."

Hand Dipping Chocolates.

(By courtesy of Cadbury Bros., Ltd., Bournville.)

Refining Edible Oils

By H. W. Avis

Last month Mr. Avis outlined the extraction of oil from seeds and nuts. He now describes how the oil is bleached, deodorised, and freed from acid.

AFTER THE oil has been removed from the seeds it has to be treated in several ways before it is suitable for edible purposes.

The chief uses of refined oils are in the margarine, compound lard, and cocoa butter substitutes industries, and the aim is to obtain oils which are bland to taste, pale golden-yellow in colour, and with practically no free fatty acids present.

The oil expressed from the seeds is run into tanks and allowed to stand, in order that the dirt and albuminous substances may sink to the bottom as sludge, and the clear oil can be drawn off or else it can be filtered.

Filtration is usually carried out in a plate filter-press, which consists of a series of recessed iron plates which are covered with woven fabric cloths and clamped closely together. The oil is forced through the centre of the plates by means of pumps, the solid impurities being held back by the cloths, while the clear oil flows out through taps at the side of the plates.

Neutralising.

From the press the oil runs into tanks ready for the removal of free fatty acids. Before this is done a small sample is removed and tested by means of caustic soda in order to determine the amount of free fatty acids present, from which the amount of caustic soda required to neutralise the batch can be calculated.

The caustic soda is made up to a certain specified strength, usually about 10 per cent., and stored in a calibrated tank. The oil is in a tank which is conical at the bottom and usually fitted with a steam coil to keep the oil at the required temperature.

When the oil is warm the required amount of caustic soda is sprayed on through very fine jets, which are sometimes made to revolve; it is necessary to have the liquid in a fine spray, otherwise there is always a possibility that the oil will not be neutralised properly, large globules of liquid sinking through the oil without exerting the maximum neutralising power.

The tanks are sometimes fitted with an agitating gear which revolves slowly, bringing the caustic soda into contact with all the oil. There is, however, a danger of an emulsion being formed which may contain a large quantity of the neutral oil. These emulsions are very difficult to break; salt will sometimes aid the clearing, but it is by no means infrequent that it is impossible to effect separation, in which case the yield of neutral oil is considerably reduced.

After the caustic soda has been added the oil is allowed to stand, in order that the soap-stock may settle; if kept warm the separation is speeded up. The soap-stock is then run off at the bottom of the tank, and it is possible to see, from try-cocks fitted on the sloping sides, when most of the soap-stock has been run off; this will save losing very much of the neutral oil. The neutral oil is then washed with water to remove any soap-stock which may be left; after standing this is run off as completely as possible.

In the case of cotton seed oil the "foots" are very thick and almost black in colour, and are usually used for what is known as "black grease"; for all other soap-stocks the usual treatment is with crude sulphuric acid; this liberates the fatty acids, which are then used mainly for soap making.

This "acid oil," as it is usually known, is sold on the amount of neutral oil it contains.

Bleaching.

The oil is then pumped into the bleaching tank, which is steam heated and which can be put under vacuum. It is usually fitted with an agitator to keep the oil gently stirred; this is very important after the bleaching material

has been added, but before this is done the oil is warmed under vacuum until it is quite dry. When all the moisture has been driven off the bleaching material is added.

It is usual, when the oil is intended for edible purposes, to use either fuller's earth or one of the activated carbons which are now available and which are proving very effective. Many other substances have been suggested for removing the colour, but they are not usually adopted for this class of work.

After the oil has been warmed for about 20 minutes with the bleaching material, the agitation is stopped and the oil again filtered through a filter-press. When all the oil has passed through, the press is usually steamed out to remove as much oil as possible. The bleaching material generally retains about 5 per cent. of oil, and this is sometimes recovered by means of extraction with volatile solvents.

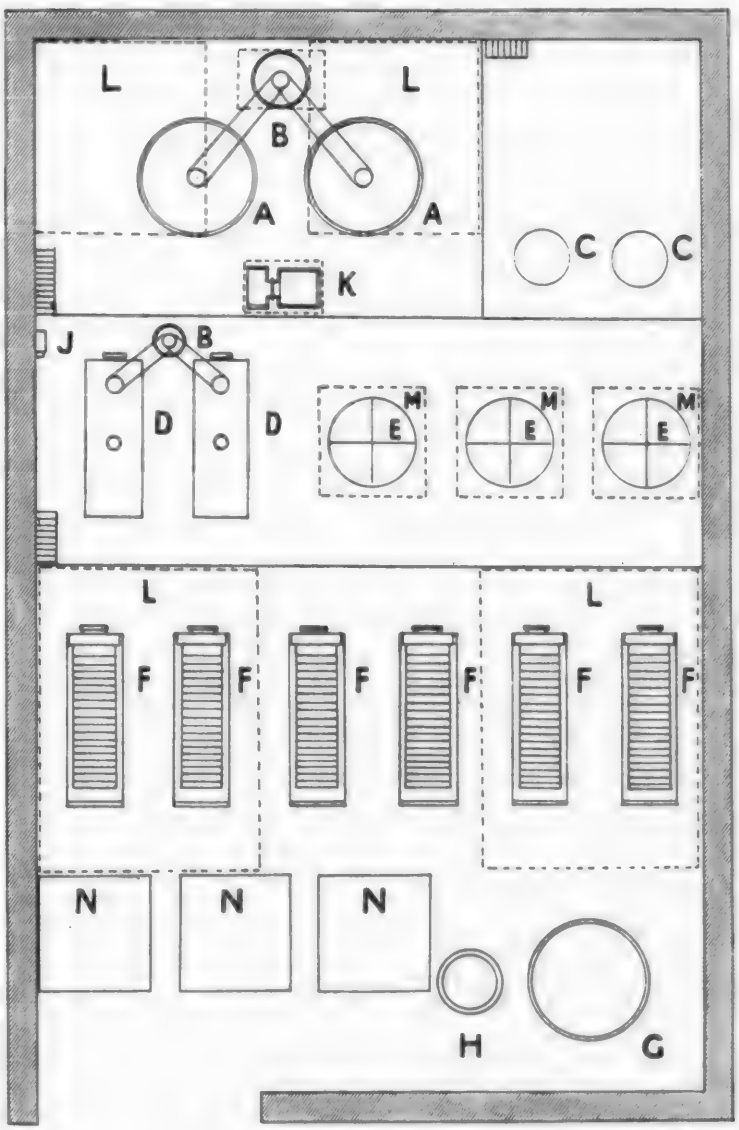
Deodorising.

The final process to which the oil is subjected is that of deodorisation. It is probably the most important part of the entire process, for it is on this that the oil depends for its absence of taste or smell.

The process is carried out in tall cylindrical tanks which are fitted with a closed steam coil, a water coil, and a perforated steam coil.

The oil is run in so that it occupies about one-third of the vessel, and the whole tank is put under a high vacuum. Steam is passed through the closed coil until the oil has reached the required temperature. Super-heated steam is then passed through the open coil, so that the temperature reaches about 250° C.; owing to this high temperature it is very important that a high vacuum is maintained—if not, the oil is liable to become oxidised and unpleasant flavours will develop.

The steam and vapours are passed through a series of condensers before reaching the vacuum pumps; if this were not done the volatile matter from the oil would be drawn into the pumps and would cause a considerable amount of damage.



H. W. A.

Lay-out of Edible Oil Refinery.

A. Deodorisers.
B. Condensers.
C. Caustic tanks.
D. Bleaching tanks.
E. Washing tanks.
F. Filter presses.
G. Boiler.
H. Superheater
J. Motor.
K. Vacuum pump.
L. Storage tanks.
M. Soap-stock and storage tanks.
N. Crude oil storage tanks.

The whole process of deodorising takes some hours, and during this period samples are taken to determine when the oil is sufficiently free from taste and smell. Immediately it is considered sufficiently flavourless the steam is stopped. While the oil is still under vacuum cold water is allowed to flow through the coil until the temperature of the oil has dropped below 60° C.; the vacuum is then released and the oil run into storage tanks and is ready for use.

A great improvement in the process of removing the flavour has been achieved by the use of the continuous deodoriser. With this plant it is essential to have a good supply of oils ready to be deodorised, for there is no point in having the deodoriser continuous unless this supply can be maintained.

The method is the same in principle as the batch system in that steam is used to remove the taste and smell, but in this case the oil is preheated under vacuum to the required temperature and is then forced

through the top of the deodoriser in a fine spray, which comes in contact with dry, superheated steam rising from the bottom of the tank. The oil becomes deodorised by passing through the steam, this latter being drawn off by means of the vacuum at the top of the tank, and the oil on reaching the bottom of the tank passes over cooling pipes into a receptacle from which it is drawn off to storage tanks, the vacuum release being so arranged that it does not interfere with the working of the deodoriser.

This type shows a great advancement on the older type of deodoriser, and represents a great saving of time and overhead charges. There have been many difficulties to overcome, but now that these have been accomplished it marks the first step towards the ideal of continuous refining; when this will be attained is still a matter for conjecture.

Much work has yet to be done towards perfecting a plant for the continuous washing of the oil with caustic soda and the subsequent removal of the soap-stock, and it is towards the design of this type of plant that work is now being carried out. Although many ingenious methods have been suggested for the separation of the soap-stock from the neutral oil, the chief difficulty seems to lie in the slow separation of these two substances, and this is liable to cause complications unless very carefully handled.

There is, however, a patent in this country by Craig and Lever Bros (E.P. 224928/1923) which combines the process of deodorisation with the removal of the free fatty acids and eliminates the alkali refining of such oils as palm kernel, coconut, ground nut, and palm oil. The process is based on the distillation of the fatty acids under reduced pressure in superheated steam to 200° C. It is claimed that if the oil is bleached in a special manner first, the fatty acids obtained are practically white and there is no loss of neutral oil.

With regard to the continuous bleaching of oils, the difficulties here seem to be of quite a definite character—namely, the mixing of the bleaching agent with the oil, and, later, the separation of the former at such a speed as to render it continuous. The filtering of the oil could be accomplished either by means of a battery of filter-presses or by centrifugal separators, which could be used in rotation; and no doubt by means of experimental work it would be possible to overcome the other difficulties, but this type of bleaching plant is naturally dependent upon the neutralising plant, and it is this latter plant which must be perfected first.

It is almost impossible to give exact temperatures and times for the various processes, as these must to a certain extent be worked out to suit the plant, but it is upon these figures that the quality of the oil will largely depend. Other factors, such as the amount of caustic soda required, the amount of bleaching materials, and the length of time required for deodorising, differ, of course, with each individual batch of oil treated. Nevertheless, it is a combination of all these factors which goes a long way to ensuring the highest possible yield of refined oil of a quality which will meet with the approval of manufacturers who use it for so many different products at the present day. In view of the ever-increasing demand and importance of refined oils, it is very necessary to ensure that they are of the very finest quality.

New Companies

HOME-MADE CAKE SHOP (BISHOPS STORTFORD), LIMITED. (276420.) To take over the bus. cd. on at 16a, Bridge St., Bishops Stortford, Herts, as "The Home-Made Cake and Tea Shop." Nom. Cap.: £1 000 in £1 shares (500 pref. and 500 ord.).

BUNNY BISK, LIMITED. (276369.) Clun House, Surrey Street, Strand, W.C. 2. To carry on the bus. of biscuit mnfrs., etc. Nom. Cap.: £2,200 in 2,000 pref. shares of £1 and 4,000 ord. of 1s.

HORROCKS AND WATSON (SPRINGFIELD), LIMITED. (276341.) 2a, Oak Street, Southport. To carry on the bus. of mnfrs. of and dlrs. in potted meats and fish, bottlers of sauces, fruits, pickles, etc. Nom. Cap.: £3,000 in £1 shares.

A. W. HENRI, LIMITED. (276322.) 10, Coleman Street, E.C. 2. To carry on the bus. of mnfrs. of and dlrs. in canned goods, dried fruits, bottled goods, etc. Nom. Cap.: £2,525 in £1 shares (525 redeemable pref. and 2,000 ord.).

LEA VALLEY HYGIENIC MINERAL WATER COMPANY, LIMITED. (276344.) 18 and 19, Ironmonger Lane, E.C. 2. To carry on the bus. of mnfrs. of and dlrs. in mineral and aerated waters, etc. Nom. Cap.: £300 in £1 shares.

EAST KENT GROWERS, LIMITED. (276545.) To cultivate asparagus and other vegetables and produce, etc. Nom. Cap.: £5,005 in 5,000 redeemable pref. shares of £1 and 100 ord. of 1s.

KNEVETT BROTHERS (1933), LIMITED. (276384.) 116, Fore Street, E.C. 2. To enter into an agmt. with the liquidator of Knevett Bros. Ltd., and to carry on the bus. of fruiterers and greengrocers, etc. Nom. Cap.: £2,500 redeemable prefd. shares of £1 and 10,000 ord. shares of 1s.

H. HALMSHAW, LIMITED. (276501.) Ulerby, Lincoln. To carry on the bus. of importers and exporters of and dlrs. in corn, peas, seeds, and grain, etc. Nom. Cap.: £5,000 in £1 shares.

MOBILE FOOD SUPPLIES, LIMITED. (276391.) 34, Bedford Row, W.C. 1. To carry on the bus. of proprs. of vehicles for the sale of fish and foodstuffs, etc. Nom. Cap.: £2,500 in £1 shares.

EUROPEAN FRUIT DISTRIBUTORS, LIMITED. (276240.) 12-13, Henrietta Street, Strand, W.C. 2. To carry on the bus. of importers and exporters of and dlrs. in fruit, vegetables, and other foodstuffs, etc. Nom. Cap.: £500 in £1 shares.

The above-mentioned particulars of new companies recently registered have been extracted from the daily register of Messrs. Jordan and Sons Ltd., company registration agents, Chancery Lane, W.C. 2.

Mr. J. H. Brookman

MR. J. H. BROOKMAN, the well-known expert on the marketing of canned and prepared foods, has accepted an appointment with British Industries House, Marble Arch, London, W. 1

Mr. Brookman is able to give very useful information to food manufacturers generally. For the next two or three weeks he will be seen at British Industries House without previous appointment, and there is little doubt that the average manufacturer would glean a great deal of interesting information from a conversation with Mr. Brookman.

THE CHOCOLATE AND CONFECTIONERY EXHIBITION

An Interesting Show Anticipated

AS MOST of our readers are aware, the Chocolate and Confectionery Exhibition is this year being held in the Empire Hall, Olympia, from the 30th of the present month to September 7. Every manufacturer of confectionery would be well advised to make a point of visiting the exhibition at least once during this period. Not only is there a good deal of attention being paid to the selling side proper (in the way of window displays arranged by experts, etc.), the manufacturer should also be able to acquire a good deal of useful information on improvements in production methods, plant, and packaging aids. In an exhibition of this kind there is invariably something for everybody to learn.

It is impossible to give here anything like a complete list of the exhibitors. Fuller information on this point may, of course, be had on application to the sponsors, the Manufacturing Confectioners' Alliance.

Messrs. Baker Perkins, however, occupy space on the ground floor, at Stand C. 21; their exhibit is composed chiefly of wrapping machines, and is very well worth visiting.

Among other exhibitors of outstanding interest should be noted the following:

Stand No. C. 31. Fredk. Boehm, Ltd.
.. .. C. 14. Brierley, Collier and Hartley, Ltd.
.. .. C. 15. W. J. Bush and Co., Ltd.
.. .. C. 5. Cooke, Tweedale and Lindsay, Ltd.
.. .. C. 23. Corn Products Co., Ltd.
.. .. B. 2. Cowan's Ltd.
.. .. C. 6. Fisher's Foils, Ltd.
.. .. C. 7. Hansella, Ltd.
.. .. C. 27. Low and Duff, Ltd.
.. .. C. 25. W. Lusty and Sons, Ltd.
.. .. C. 33. Renold and Coventry Chain Co., Ltd.
.. .. C. 16. Johnson and Jorgensen Flint Glass Co., Ltd.
.. .. C. 40. Samuel Jones and Co., Ltd.
.. .. C. 1. Polak and Schwarz (England), Ltd.
.. .. C. 32. Spicers' Waxed Sales, Ltd.
.. .. C. 12. Stvenson and Howell, Ltd.
.. .. C. 43. Transparent Paper, Ltd.

FOOD MANUFACTURE is on this occasion represented by Exhibit C. 34. The stand is conspicuously situated and should not be at all difficult to find. Visitors, as usual, will be made heartily welcome.

A Moulding Machine Automatically Depositing Liquid Chocolate into Metal Moulds, which are subsequently passed over Shaking Tables and into a Cold Chamber.

(By courtesy of J. Lyons and Co., Ltd.)

GOOD FOOD AND VITAMINS

"Formerly, when I was made Doctor of Medicine, I sent a copy of my thesis to all the Professors of the Faculty, without exception. Only two of them replied: Vulpian and Charcot. They were undoubtedly the most illustrious, perhaps the only illustrious, members of the Faculty, so I am convinced that politeness is not incompatible with fame."—PROFESSOR CHARLES RICHER in *Le Savant*, 1923.

THE ABOVE is Mr. R. Whymper's elegant way of "poking us in the ribs." It has arisen out of our note in the February, 1932, issue, page 32, on the possibility of over-dosage by vitamins. We sounded a warning, to which Professor Drummond replied in effect that we did not know what we were talking about. Like Galileo, we bowed our heads to authority. (Mr. Whymper dubs it "a craven apology to the professor.")

The outcome of it all is that Mr. Whymper is annoyed. "You have apparently," he complains, "not published my letter of explanation, which was a perfectly honest defence of myself and an attack upon a real evil. This is, I am afraid, very cowardly on your part, but a misfortune to which the technical press is prone—for reasons you know as well as I do.

"On the question of vitamins," he continues, "it appears that I stand nearly alone in my ignorance, according to the professor, for not knowing that 'a large proportion of the population of our cities are actually, to-day, both qualitatively and quantitatively, deficient in respect of vitamins.'

"Oh, professor! The words actually quoted from my letter were 'neither I nor the majority of people have ever suffered from vitamin deficiency.' Surely a professor, even if not professing legal, philological, grammatical, or literary prowess, will agree that there is a vast difference between 'a large proportion of the population of our cities' and 'I nor the majority of people.'

"No person in his senses, whose business it is to know the trend of modern science in foodstuffs can possibly escape the daily increasing output of literature concerning vitamins or be ignorant of their value in certain conditions of life. Neither can he be unaware of advertisements shrieking from every hoarding concerning vitaminised foods—from coffee to tomato juice, from bread to milk from cows fed on irradiated meals. No one, however, except with his tongue in his cheek, would suggest that vitamin poisoning is likely to occur yet, so that I can safely repeat that I, personally, am suffering from oversufficiency and not deficiency of vitamins, being literally fed to the teeth both with products vitaminised, too often for the profit of the exploiters rather than that of the consumers, when I am asking for something different and better, and with the craze which has developed like other crazes of old—standard flour, miniature golf, whole-wheat bread, roughage, 'Reach for a Lucky instead of a sweet,' feeding by calories, and technocracy, to name a few that at once come to mind—all of which unquestionably had, and still have, good points about them on occasion (and more than the *little* foundation of fact, professor, which you demand before published statements are made), but submerged and eventually drowned to make an advertiser's holiday, leaving a trail of harm behind by destroying the confidence of the people in good principles, ruined by pseudo-scientific exploitation. I would not like to see vitamins so discredited.

"No person with a grain of knowledge in the dietary science could deny the immense importance of vitamins in the cure and prevention of certain civilised complaints to which improper feeders are subject. The fact remains and stands to the glory of the scientists. But, on the other hand, no one with a particle of honesty can applaud the exploitation of a 'phobia' by advertisement by implication, with or without the sanction of responsible and reputable scientists, that enables any opportunist manufacturer of foodstuffs to boast of including a healing elixir, by a patented process or purchased endorsements, in his products offered to an ignorant, fear-ridden public of his own creation.

If the World knew how to Eat.

"It is only the exaggeration of fact that I am out to destroy, and one may well ask, in passing, why improper feeding is encouraged by science and industry, only then to be remedied by vitamin treatment, and why vitamin dosage is not left in the able hands of experts and specialists. If vitamin *protection* of our foodstuffs were the cry, no one, not even a gourmet, would raise the feeblest voice of protest; but, as it is, we are swamped with foodstuffs that should never have been tampered with any way, if the world knew how to eat.

"A professor, especially when learned and protected by anonymity, is like the Christian God. Alike, they are without a sense of humour, so that editors in particular and publishers generally fear the wrath of Heaven in allowing any mere mortal to disagree with them. They are too aloof; they experiment too much *in vitro* and *in cælo* to get a clear conception of human beings as they live their daily lives on earth or outside the sheltering porticoes of a local clinic or laboratory. In these days they do not descend to earth or leave the land of their particular, if limited, elect, but, as Francis Bacon wrote about a certain tribe of philosophers, 'they labour with great diligence and accuracy in a few experiments, and thence venture to build up philosophies; and strangely wrest everything else to these experiments.'

"And, again, they are akin in that both suffer more from a mangling of their real words of wisdom at the hands and mouths of a too-ardent following of disciples than from their own prime indiscretions.

"Every ailment cannot, of course, be wrested to suit the 'vitamin deficiency' facts and theories any more truthfully than any one theory can be twisted to meet different universal facts. This information may seem superfluous, since it is unquestionably realised by the wise, but it is also open to argument by fanatics and not open at all to argument by exploiters."

CORRESPONDENCE

EVAPORATION

To the Editor.

DEAR SIR,

We have read with interest the article "Evaporation in the Food Industries" in the June number, in which recent developments in the system of vacuum evaporation have been explained most comprehensively.

However, your readers should not remain under the impression that the "Lurgi" Evaporating Plant is the only one in which the heat applied in the heating chambers is low so as to differ only by a few degrees from the temperature of the high vacuum liquor compartments in an evaporating plant. In this direction English makers in this speciality, such as Messrs. Blair, Ltd., Mirlees Watson, and George Scott and Son, have also made considerable progress, and there are no special patented features in this connection. It is a matter of keeping vacuum in the space of the heating surface also. There is also the German Wiegand evaporator, in which this system has been used for several years. We have erected quite a number of evaporating plants in this country and are erecting several at the present time in which low vacuum recompression temperature is applied to the heating surface, and Wiegand has a record of 360 evaporating plants working in Continental countries.

Yours faithfully,
F. JAHN AND CO.

To the Editor.

DEAR SIR,

In reference to Mr. Jahn's letter, whilst I have no desire in any way to belittle the progress made by other firms in the technique of evaporation, I must protest against a statement that there are no special patented features in the Lurgi system described. Your readers are referred to B.P. Nos. 237,309, 138,871, and 208,130. If Mr. Jahn had desired to make the point that there was nothing new in the vapour recompression system, he might have gone back to the system which was proposed by Pelletan over 100 years ago, and it must be recognised that every vapour recompression system employing steam jet thermo-compressors is only an application of the same principles.

It is, however, necessary to point out to your readers that, whilst the physical principles have been recognised, many firms have tried to produce the results in practice and have definitely failed. The difficulties arising from the presence of non-condensable gases in the heating steam and the effect of these upon heat transfer, not to mention the special problems which occur in the accurate design of steam jet apparatus, have prevented the attainment of success on the part of many evaporator firms who have otherwise enjoyed good reputations.

On referring to the particulars of the Wiegand evaporators which I have in my possession, I find that these have been more especially applied to such substances as glue and chemical products, and the use of vapour recompression in most cases has as its primary object thermal economy regardless of evaporation temperature. The application of vapour recompression to the first effect of a series is in no way new, and, of course, does not serve to reduce the evaporation temperature. I think it is correct to say that only a small fraction of the number of plants mentioned by Mr. Jahn are of the single effect recompression type, and few, if any of them, work under conditions comparable with those described in the article.

Whilst it is true that the success of the Lurgi system of evaporation depends in principle upon maintenance of an unusually high vacuum in the evaporator, and in the maintenance of a partial vacuum in the heating space, the attainment of these results under actual practical conditions involves the solution of some interesting and not very simple chemical engineering problems, and I think that Mr. Jahn will find on looking more closely into this question that he has underestimated the progress which Messrs. Lurgi have made in this direction.

Yours faithfully,
HUGH GRIFFITHS.

SPICE OLEO-RESINS

To the Editor.

DEAR SIR,

We are interested in query No. 1,289 in your June number. We would point out that pepper, ginger, and cayenne are used in sausages for their pungency as well as for their aromatic flavour and that this pungency is absent from the essential oils, so that your correspondent would be disappointed if he used the latter only. We manufacture oleo-resins of pepper and ginger, which contain all the pungency as well as the flavour, and we supply these for flavouring sausages and other similar articles. The yield of oleo-resin from ginger and from pepper is from 5 to 7 per cent. With regard to cayenne, we make an oleo-resin of capsicum with a yield of about 10 per cent., but the preparation usually used is "Soluble Capsicin," the yield of this being about 20 per cent., and it is in most cases more convenient to use than the oleo-resin as it is soluble in water and dilute alcohol, whereas the oleo-resin is only soluble in oils and organic solvents. As you imply, the difficulty in using such concentrated preparations is to get them uniformly distributed throughout the product.

Yours truly,
G. STAFFORD ALLEN,
Director, Messrs. Stafford Allen and Sons, Ltd.

TRADE NOTES

Change of Address.

Messrs. J. Harrison Carter, Ltd., the well-known engineers, manufacturers of disintegrating plant, have moved their London office from Mark Lane to Sardinia House, Kingsway, W.C. 2. The telephone number of their new address is Holborn 7724.

The head office and works still remain at Dunstable.

* * *

Packing in India.

The trend of industrial conditions in India to-day is bringing about certain important developments in British industry, and in order to maintain existing business and develop new openings, many leading British manufacturers have found it necessary to arrange for manufacture in India itself. This activity has brought about an increasing demand for a reliable source of supply of tin containers equal to the standard of quality in England.

To meet this demand the Metal Box Company, Limited, has equipped a factory in Calcutta under the management of Mr. D. W. Brough. Already the Metal Box Company of India, Limited, as the new company is called, is said to be in a position to supply high-class plain and decorated tin boxes for a wide range of products. Attention is also being paid to the "open top" style of can for the packing of fruit, vegetables, and other food products.

The parent company through its associations and connections offers a complete packing service which it is pleased to place at the disposal of those who contemplate packing in India.

* * *

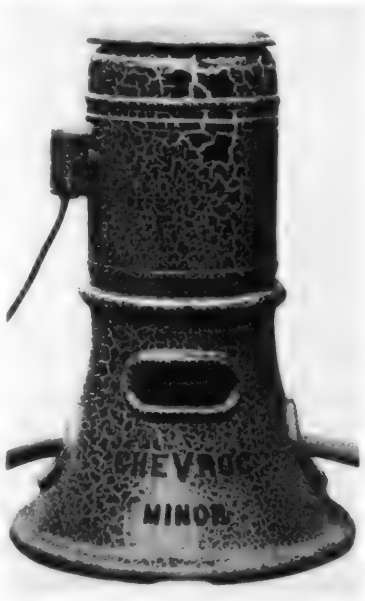
National Mark Canned Products.

The Ministry of Agriculture and Fisheries has issued a new leaflet giving a brief account of the National Mark schemes for canned and bottled fruit and vegetables and containing a list of authorised packers under these schemes. In addition to the names and addresses of the authorised packers, the leaflet specifies in detail the fruits and vegetables packed by them respectively, both under the National Mark and without this national trade mark. It also indicates the location of their factories and the private brands under which their output is sold. The list is in two sections—namely (1) Canned Commodities, and (2) Bottled Commodities.

Copies of the leaflet (Marketing Leaflet No. 20b) may be obtained, free of charge, on application to the Secretary, Ministry of Agriculture and Fisheries.

Car Washing.

We reproduce, by permission of the Power Plant Co., Ltd., a photograph of their improved Chevroc Minor car washer. The actual colour combination is red and black, mottled as in the photograph.



The improvements include a more expensive and better motor, improved switch gear, and a pump with considerably larger bearings and centralised lubrication. The alterations are claimed to be such as to render the pump as nearly as possible foolproof.

* * *

Label Perforating.

As a means of identifying packages and ascertaining their age and origin, perforation of the labels affixed to them has a good deal to recommend it. The retailer should in all cases sell the oldest goods first, instead of placing new goods on the front of his shelves. The date on the label (either plainly perforated or in code) enables the manufacturer to watch and control this tendency through his salesmen or inspectors.

A pamphlet describing an interesting series of improved label perforating machines, of all sizes, has been received from Jean O. Sauven, from whom further details may be had on application.

Canning at Aintree.

In connection with the recent opening by the Earl of Derby of Messrs. W. P. Hartley's new pea canning factory at Aintree, readers will be interested to learn that the full line of machinery installed in this very modern establishment was supplied by Food Machinery (Mather and Platt), Ltd. The ingenuity in design and constructive soundness of the various machines call for no comment. Incidentally, they are all British.

The factory itself was designed by Mr. Frederick W. Nicholson.

* * *

Ultra-Violet Research Cabinets.

Within recent years ultra-violet research in industry has greatly increased in scope and importance. An article which deals with its bearing on the analysis of foodstuffs is to be published in our next issue.

An ultra-violet cabinet designed to meet the demand for a thoroughly efficient apparatus at a moderate price has recently been introduced by Messrs. Griffin and Tatlock, Ltd., and is known as the Microid.

The twin Ultrasol mercury vapour lamp unit is contained in an amply ventilated housing of sturdy and pleasing design. Below the housing is the observation chamber, with a detachable panel, enabling large surfaces to be examined through the available aperture.

The filterplate, of special design, transmits ultra-violet rays to the objects placed in the observation chamber, producing intense fluorescent results. Curtains are provided to exclude unfiltered light during tests.

* * *

A New Filling Machine.

A new and interesting machine for the rapid filling of all kinds of powders into packages is the Jackson-Crockatt Patent Minor loose filling machine.

This machine fills, at a speed of 24 per minute, packets from under ¼ oz. to about 4 oz., and has the advantage of possessing neither pulleys nor shafting, besides being designed to fit on any table. It is supplied complete with an electric motor which may be directly connected with the ordinary electric light supply.

Messrs. Jackson and Crockatt, Ltd., also supply a larger machine of the same type (Major model), as well as a Shell Filler and Tight Packer, carton sealing machines, various other packers and fillers, and the Jackson-Crockatt Patent Granulator.

Cocoa Shortage Denied.

Following a report of a certain cocoa and chocolate shortage as the result of a disease known as "witch broom" in the cacao plantations of Dutch Guiana, Ecuador, and Trinidad, the following statement was recently made by Mr. A. W. Knapp, chief chemist of Cadbury Bros., Ltd.: "Only a small proportion of trees have been affected, and in any case these countries supply a relatively small percentage of Great Britain's requirements. More than half the world's cocoa comes from West Africa, where witch broom has never been known."

* * *

Preservatives.

We have recently received samples of nipagin, nipasol, and nipakombin, preservatives and antiseptics for use in pharmaceuticals and foodstuffs.

A short article on these interesting substances (nipagin A is a chemically pure form of monomethylcarbinylparaoxybenzoate) was published in the January, 1931, issue of the *Manufacturing Chemist*. It was by Dr. T. Sabalitschka of Berlin University, who states that many types of foodstuffs—"jam, pulped fruit, sweetened and unsweetened fruit juices, fruit wine, malt extract, lemonade, fish preserves, margarine, butter, bread, and pastry"—may be very efficiently protected against decomposition by mould fungi yeasts and bacteria with the aid of these preservatives.

Nipagin, nipasol, and nipakombin possess slightly different characteristics (making one or another of them particularly applicable in any specific instance), and—an important point from the manufacturer's point of view—to guarantee the maximum of stability and sterility, they need only be used in very small quantities. Further information may be obtained from the English agents, Messrs. P. Samuelson and Company.

* * *

Bakers' Exhibition.

Bakers and confectioners who intend to compete at the London exhibition, if they are members of a recognised bakers' association, should have received a copy of the official schedule. Any member of the trade who desires a schedule but has not received one, and who is a member of any association, should apply to his secretary; but anyone who is not a member of an association should apply to H. S. Rogers, 11, Queen Victoria St., London, E.C. 4., who will be pleased to forward a copy post free.

Secretaries of associations requiring a supply are advised to communicate with Mr. Rogers.

* * *

Confectionery Exhibition.

The Manufacturing Confectioners' Alliance has been informed by the Railway Clearing House that its application for the privilege of returning unsold exhibits from the exhibition at half rates by either goods or passenger train has again been granted.

It must, of course, be appreciated that to obtain this privilege the goods must previously have been forwarded to the exhibition by rail, and the necessary certificate, obtainable from the exhibition offices, attached to the returning consignment note.

Railway officials are in attendance both before and after the exhibition to assist exhibitors in receiving and dispatching their goods and to render what other help they can.

* * *

New Equipment.

We are informed that Messrs. L. A. Mitchell, Ltd., the Manchester chemical engineers, have been appointed sole British agents for the sale of the new Hildebrandt fine grinding mills and air separators.

The air separators can be supplied separately for screening purposes or can be attached to existing mills, in order to produce a uniformly ground product. The Hildebrandt mill is said to be capable of grinding with hard and soft materials to a fineness of 330 mesh, although this degree of fineness can be readily adjusted within wide limits.

All communications on the subject should be addressed direct to Messrs. L. A. Mitchell, Ltd.

* * *

British Vegetable Parchment.

Steady progress during the past year has been shown by the British Vegetable Parchment Mills, Ltd. It will be remembered that in 1932 this company erected two new parchmentising machines, thereby doubling the productive capacity of the mill and making it capable of a truly enormous total output.

We are informed that sales, during the year, again show an increase over those of previous years, despite intensified competition both at home and abroad. So far as the Dominion markets are concerned it is rather paradoxical that colonial butter now has preferential entry into the United Kingdom, although no similar preference is extended by the colonies to the entry of British-made vegetable parchment for wrapping and packing the butter sent to this country. In the trade treaty recently concluded between Great Britain and Denmark, it was laid down that all Danish butter sent to the United Kingdom should be wrapped in vegetable parchment made in this country. It will be seen, therefore, that the Danes recognise strongly the necessity for reciprocal trade, and it is to be hoped that effect will soon be given to this principle, in so far as parchment is concerned, by the Dominion Governments also.

The fact that the British Vegetable Parchment Mills have been able to show a substantial increase in export business during the past year is practical proof of the service and quality given by the mills and the progressive policy of the management.

* * *

Olive Oil.

A price list relating to olive oil has recently been received from Messrs. Fredk. Boehm, Ltd.

Although small (there are few words wasted in "descriptive" matter), the list is quite comprehensive and very well adapted to meet different tastes and requirements. Oils are offered from three separate sources—Italy, France, and Spain.

A practical experience of the trade extending over a period of thirty-five years enables Messrs. Fredk. Boehm, Ltd., to handle the subject of olive oil with definite authority. Copies of the list referred to may be obtained from them on application.

This new 2-ton forward control Morris-Commercial is of interest because the special body arrangement allows for the van all-weather protection as well as lorry loading ease. A tarpaulin sheet is carried to cover the open part of the body.

INFORMATION and ADVICE

FISH PASTE—FILLING MACHINE—SEPARATION IN SAUCE—BEEF DRIPPING—SUET—PLUM PUDDINGS—BEEF BRAWN—TURKISH DELIGHT—POTTED CHICKEN—HORSERADISH—DRIED SOUP—STERILISATION OF FISH PASTE—BOSTON CREAM—MOULD ON LEMON CURD

Fish Paste.

1,373. *We shall feel very much obliged if you will let us have any available data which you may have regarding potted meat and fish paste of all descriptions, and also if you will put us in touch with one or two firms who produce machines for filling the jars with paste.* (Ireland.)

We would refer you to articles published in the June and July, 1932, issues of this journal. If the information in these articles does not meet with your requirements, we shall be glad if you will let us know.

Suggestions were made regarding machines for filling jars with paste.

1,374. *We are having trouble with potted meats and fish pastes. After preserving in open tank the contents expand, but do not contract when cooled.* (England.)

We should imagine that your trouble is due either to having too much starchy matter in the paste, the expansion being caused by the starch gelatinising and, therefore, swelling, or by having too much air incorporated in the paste. If the latter is the case, you should fill your pots from a sausage filling machine.

1,375. *Could you give us any special information regarding plant for boiling preserves?* (Scotland.)

It was suggested that for detailed information of the type he requires the enquirer should get in touch with the suppliers of plant.

A list of such suppliers was forwarded.

1,376. *I should like particular information on the refrigeration of foodstuffs, especially meats and vegetables. If you can refer me to anyone who can give me special information on this subject, I shall be greatly obliged.* (Tasmania.)

We are afraid that it is difficult for us to give you anything useful in the way of information, as your question is rather vague and covers such a wide field. If you could give us a better idea of what you are aiming at, we should be glad to help you.

You will find a section devoted to the subject in the *Food Industries Manual*, and would suggest that you refer to it. There is a large amount of literature published on the subject, if you refer to the theoretical and technical side, but if it is from the practical point of view you require information, we would advise you to get in touch with the usual suppliers, such as (names indicated).

1,377. *Kindly give recipe and method for making a cheap fruit and spice sauce to cost about 9d. to 1s. per gallon.* (England.)

See previous replies to similar questions and the article by Elsbury in the present issue.

Filling Machine.

1,378. *The nature of our business makes necessary the filling of a large number of different sized tablets into bottles, and we find it difficult to get a suitable machine for this work.*

Some years ago we received from England an illustrated advertisement of a counting scale, which we thought would be suitable. At that time one of our employees was visiting England, and we forwarded to her the illustration and descriptive literature, asking her to look into this. As she was moving from place to place, she did not receive our letter, and the illustrations containing the address were lost.

As we remember it, the tablets were fed from a hopper with an automatic shut-off into a pan. On the other side of the balance was a filled bottle with a number of tablets. Taking the bottle from the scale automatically filled the shut-off pocket, and deposited the tablets in the next bottle.

A device of this kind should speed up our work, and we believe would be satisfactory. It may be that you have knowledge of this particular scale, or that you know of something else of the same kind equally satisfactory. (Canada.)

We shall be glad to hear from any firm that can supply such a machine.

1,379. *We have a cable enquiry from one of our Australian clients for carotene, for colouring margarine, and shall be obliged if you will kindly give us the names and addresses of manufacturers.* (London.)

Names and addresses were forwarded.

1,380. *We are interested in the manufacture of drained and crystallised cherries, and are anxious to obtain some up-to-date hand pitting machines to take the stone out of the cherries. We are unaware of any manufacturers or suppliers of these machines, however, and if you are therefore able to put us in touch with British and French manufacturers we shall be greatly obliged.* (London.)

A probable source of supply was indicated.

1,381. *I require a clean, quick-drying adhesive suitable for all types of climate, dry heat, damp, etc. My labels for cans lap over about ¼ inch and I require a good firm fastening, capable of sticking under all variations of temperature. Please ask your advertisers to communicate direct with me and forward samples without delay.* (Tanganyika.)

This was done.

Separation in Sauce.

1,382. *Our trouble is one of separation in tomato and fruit sauces. The sauce is manufactured from dates, tamarinds, tomato, and apple, all made into a fine pulp before cooking. The thickening agent used is gum tragacanth of medium quality, and the remaining ingredients are sugar, acetic acid, vinegar, and spices.*

In the process the gum tragacanth in fairly large pieces is soaked in water for four days, and is heated to produce a uniform mucilage. A given quantity of this mucilage is placed in the steam-pan with sugar and cooked for about fifteen minutes, to obtain a solution.

The other ingredients are then added, the acid last of all, and the whole batch brought to the boil in a further fifteen minutes, and then poured into barrels.

Whether we fill the bottles hot from the kettle, from the tubs after twenty-four hours' standing, or even after periods of longer standing, we obtain a line of clear liquid at the top of the bottle after about four days in store. This is not invariable, but seems to occur in about 30 per cent. of the

batches made, and is more noticeable in the tomato sauce than in the fruit sauce. (London.)

Why not use powdered gum in place of the large pieces? Soaking overnight should be quite sufficient. Heating has a detrimental effect on the gum. Separation may be caused by using insufficient thickening agent, such as gum or cereal flour. In the case of tomato ketchup, it may be caused by insufficient tomato content or insufficient extraction of pectin from the tomatoes used. With sauces stability is helped by passing the product from the steam-pan through a pair of flat stones, and finally through a fine hair sieve. The gum after soaking should also be rubbed through a fine sieve when adding to the other ingredients in the pan.

Beef Dripping.

1,383. [*A reader gives particulars of a method he adopts for rendering beef dripping. The fat is brought quickly to the boil by a steam pressure of about 40 lb. Boiling is continued 1½ to 2 hours. Pressure is reduced to about 25 lb. and fat simmered for about 4 hours. The product lacks even surface and has tendency to develop a burnt smell.*] (Stockton.)

Overheating seems to be the cause of the trouble. When the fat is melted an addition should be made of brine (2 lb. of salt dissolved in 5 gal. of water) and the mixture stirred continuously until a temperature of 200° F. is reached. Allow to settle for 15 minutes. Skim, and separate off the dripping. Further refining, if required, may be effected by use of charcoal or fuller's earth, or by centrifuging. Acidity may be removed by alkali treatment.

1,384. *We are seeking the source of supply of a really good chocolate dipping placque to which the chocolate will adhere firmly, and are wondering if you could give us the name and address of the suppliers.* (Manchester.)

This was given.

1,385. *Will you please put me in touch with suppliers of pectin?* (Somerset.)

This was done.

1,386. *May we request you to inform us where the following are obtainable: Gervais moulds for cottage cheese; special curved knives for removing the pith of orange peel?* (India.)

Suggestions were made.

Suet.

1,387. *Would you be good enough to let us have information on the manufacture of beef suet?* (Midlands.)

Select the best suet (which must be cool and dry), rejecting blood, veins, and dark portions. Cut into approximately 2-inch cubes and place on enamelled trays to cool in a refrigerator. Dust these cubes with pure rice flour and then pass slowly through a mincing machine without forcing it. Collect the minced material on an enamelled tray, at the same time dusting it with rice flour. Replace the suet in the refrigerator for a short time, and then sift out the excess of flour through a fine hair sieve. Fill into cartons without handling.

1,388. *We shall be glad of your assistance in the manufacture of prepared suet.* (Gloucester.)

See the note given above.

1,389. *We are desirous of obtaining the names of manufacturers or dealers who can supply us with second-hand or new machines of the following description: (1) Date pulping machine; (2) onion peeling machine. Both to be worked by hand.* (London.)

Probable sources of supply were indicated.

1,390. *We are interested in the production of concentrated tomato juice, and should be glad to have any advice you are able to give us regarding the method of preparation of this juice so that its vitamin C content is unimpaired.* (Herts.)

We would first of all refer you to the article on tomato products which appeared in our December, 1932, issue. If the information contained therein does not meet your requirements, perhaps you would be good enough to let us know, and we will try and help you further.

Plum Puddings.

1,391. *Some customers of ours in New Zealand write that at the present time they make plum puddings which are packed in cardboard waxed cartons.*

This method is not satisfactory to them, however, and they are thinking about canning them, buying the tins locally in the first place and then filling and seaming them themselves.

They are also considering the canning of mincemeat. (London.)

As regards the canning of plum puddings, this should offer no special difficulty. The cans may be passed through the heat exhaust box and subsequently double seamed and sterilised in the ordinary way, or they may be retorted and then brogued, and given another quarter of an hour in the retort. The time of retorting at 240° F. would, of course, depend on the size of the can.

With regard to mincemeat, this is a more difficult proposition, and it is doubtful whether it can be satisfactorily carried out, owing to the tendency of the suet to melt and run, if the material is retorted in the ordinary way. Your best plan would be to get some tests carried out.

1,392. *Can you supply a recipe for a good household sauce costing about 9d. a gallon, using acetic acid instead of vinegar?* (Northumberland.)

Reference should be made to articles we have previously published on this subject. There is a note on cheap sauces in this issue, in the article by Elsbury on utilising waste from jelly making. We sent the enquirer a type recipe for this kind of sauce.

1,393. *Will you kindly let us know the name of the firm marketing the Lurgi system of evaporation in England?* (Irish Free State.)

Information supplied.

1,394. *In your June number of* FOOD MANUFACTURE *there is advertised for sale a filling machine. I have replied to the box number, as I am interested in the article. Would you also be good enough to let me have the names and addresses of manufacturers of similar machines?*

I require the machine for filling cartons or tins by hand or power with cornflour, semolina, and similar cereal. (I.F.S.)

Suitable names and addresses were forwarded.

1,395. *Kindly supply recipe for a filler for fish and meat pastes.* (Kent.)

These generally consist of ground rice, biscuit meal, bread, or other farinaceous material. Soya flour would be worth trying.

1,396. *Some time ago we were enquiring about lemon curd (good quality). This we are now making. From one of your advertisers we enquired the price, etc., of orange juice for making orange curd, and are offered orange juice containing 750 parts of SO_2 per million. Would this be suitable for use? Also would this comply with the various Food Acts?*

We notice in July FOOD MANUFACTURE *enquiry No. 1,330 is asking for books on honey. Perhaps Marketing Leaflet No. 31, issued by the Ministry of Agriculture, would be helpful; this leaflet covers the grading and packing of National Mark honey.* (Birmingham.)

There is no danger in using orange juice containing 750 parts SO_2 per million for the preparation of orange curd. During the boiling process the SO_2 would be driven off, and it is doubtful whether even a trace would be left behind in the orange curd.

1,397. *We are sending you a sample of fish and cutlet dressing. Will you please inform us as to the seasoning used and quantities required to hundredweight of plain dressing, which we at present manufacture of a similar colour?* (Ireland.)

This cannot be done without a proper laboratory determination, qualitative and quantitative. We are therefore forwarding the sample to a suitable laboratory.

1,398. *One of our customers has asked us to find the name of a firm that makes machines for removing husks from barley.*

We would appreciate it very much if you could give us the information required. (London.)

A suggestion was made.

1,399. *We believe we have seen advertised in* FOOD MANUFACTURE *a machine for the even tightening of screw caps on glass bottles. Can you please refer us to the makers?* (Birmingham.)

This was done.

1,400. *Will you kindly let us know the makers of a small machine to crush our meat paste to make it very smooth?*

We pass it through our mincer three times, but it is still far too coarse.

We think something in the pestle and mortar line would be the thing. (Worcester.)

A suggestion was made.

1,401. *On page 218 of your July issue (we are regular subscribers to your paper) you mentioned a swelling test on gluten by the addition of lactic acid.*

Can you tell us the percentage of lactic acid used on wet gluten? (London.)

The enquirer was furnished with a copy of Fisher and Halton's paper, in which the effect of acid concentration is dealt with.

Beef Brawn.

1,402. *Kindly supply recipe for beef brawn.* (London.)

One method is to place, say, 1 cwt. of bullocks' heads in 1 cwt. of water, adding ¼ lb. of salt and suspending in the kettle the spices (say, pepper, allspice, mace, and bay leaf) contained in a muslin bag. Simmer for 4 hours. Then remove and bone out the meat, skinning the lips and mouths. Allow to cool. Then cut up the meat into inch cubes and mix well together. Fill into containers and fill up with hot stock. If the stock is too strong, break down with hot water.

Turkish Delight.

1,403. *Can you give us formulæ and methods for the manufacture of piping jelly from both agar-agar and pectin, but without the use of fruit purée? Also formulæ for Turkish delight?* (Bristol.)

We presume that you have the recipes for piping jellies which we published in the February, 1932, issue. It should have been pointed out that the purée may be substituted by glucose. It is also possible to make a piping jelly using glucose in place of both sugar and purée. When making piping jelly you should take great care that the sugar is completely dissolved, otherwise graining will take place. Another point to note is that the boiling must not be too high.

With regard to a formula for Turkish delight, we are quoting one recipe, which has been taken from a book we are shortly to publish dealing with sweet manufacture.

Crystal sugar	60 lb.
Cornflour (good quality)	20 ,,
Icing sugar	20 ,,
Cream of tartar	2 oz.

Boil the crystal sugar with the cream of tartar in the usual way to 260° F. Cream the cornflour in 20 lb. of cold water and add, together with the icing sugar. Cook slowly until the required set is obtained, usually at about 225° F. Add the necessary colours and flavours, and, if desired, a small quantity of tartaric acid. Pour into wet tins or well-starched wooden boxes to cool. Cut and dust in icing sugar. The icing sugar in the recipe may be replaced with glucose if desired, using about 100 per cent. more. In this case the cream of tartar should be omitted, and the glucose must be boiled with the crystal sugar instead of being added afterwards.

Potted Chicken.

1,404. *Would you kindly let us have the issue in which you had an article on how to prepare potted chicken?*

We have been having great difficulty in preparing and sealing our potted chicken, and we should appreciate your advice on the matter to help us to overcome our difficulty. We are sending samples on to you. Sterilisation is done by placing the jars in boiling water for fifteen minutes. (Scotland.)

We have received the sample jar in a very putrid condition. It seems quite clear that your sterilisation is all wrong, and that your times and temperatures for this process are too low. What you ought to do is to sterilise in a retort at 240° F. for half an hour.

If it is impossible to purchase a retort, you might try stacking the jars in a tank and filling up with cold water. Gently heat to 180° F. for an hour. Bring to the boil in 30 minutes and hold there for 15 minutes. Cover the tank with bags and draw off the water.

All this is assuming that the usual precautions in cleaning and guarding against contamination are observed.

1,405. *In your "Food Industries Manual" you make reference to the use of salicyl parchment paper.*

Will you be kind enough to put us in touch with a manufacturer who will furnish us with samples of this paper? (U.S.A.)

This was done.

1,406. *Will you please forward me a recipe for an inexpensive piping jelly? I require a good one, but at the same time want the cost of it as low as possible.* (Birmingham.)

The best thing we can do is to refer you to the article on the subject which appeared in the May, 1931, issue. In this several formulæ were given, and you will be able to conduct your own experiments on these.

If after you have read this article it does not give you all the information you require, perhaps you will let us know and we will go into the matter further for you.

Horseradish.

1,407. *Is there any method of treating horseradish sauce before or after bottling to prevent it from turning brown after ten or twelve weeks' keeping? Is there any machine for cleaning horseradish roots?* (England.)

It is difficult to answer this question properly without knowing exactly how you prepare your horseradish.

Horseradish for the preparation of creams and mustards should be scraped and cleaned in hot water. When dry, the skin is grated off, after which it is shredded. This shredded material might be preserved by putting into white wine vinegar or 24 grain pale vinegar and preserved for ten days.

Dried shredded horseradish is used in the preparation of creams and mustards, etc. This should be soaked in 16 grain malt vinegar for forty-eight hours before incorporating with the other ingredients.

Dried Soup.

1,408. *Will you please suggest formulæ for manufacture of dried soups?* (Derbyshire.)

This is really a job for the consulting chemist, as details of formulæ and manipulation depend on special circumstances and requirements. It may be of some assistance to give an example to serve as a basis. This is for lentil soup. The body may be formed from, say, 40 lb. each of sago flour and potato flour and 60 lb. of yellow lentil flour. For this would be required about 16 lb. of salt and 5 lb. of sugar, together with, say, 10 lb. of powdered dried onions and sufficient powdered celery seed and white pepper to flavour. These ingredients should be heated in a steam-pan, stirring all the time. Then an adequate amount of beef extract or glutamate preparation with hot water is added drop by drop while stirring and heating until the mixture is dry. The powder may then be pressed into cubes if desired.

Sterilisation of Fish Paste.

1,409. *We beg to thank you for giving our name to several firms, regarding the purchasing of fish paste in bulk, and we have heard from them, but this is not possible. The paste must be made and sterilised right away; it cannot be kept. This being so, we are manufacturing it ourselves now.*

We have read your article in FOOD MANUFACTURE *regarding sterilisation. It only deals with tins, and it is not stated definitely how long they have to be kept in the steriliser. Our containers are the usual 3-oz. glass barrel-shaped fish paste jars. As this is a thing which we cannot find out ourselves, we therefore ask your advice:*

(1) *At the moment our steriliser will not heat above 220° F. Do you think that keeping these jars for one hour at 220° F. is sufficient, and, if not, what heat, and how long should we sterilise?*

(2) *Is sterilisation for driving out all the air, or for killing any germs inside the jars? as all our ingredients are fresh and are first cooked before being made into paste.*

(3) *If a tin of salmon should happen to be blown, could it be used? Would the sterilisation destroy the defect?*

(4) *Is there any law in this country regarding the amount of filling allowed? We read an article some time ago, and we believe it stated that 10 to 12 per cent. is allowed. But we do not remember whether this referred to America or this country. What is actually counted as filling? Is it the flour, or grease, or water, or anything which may be added besides the fish?* (London.)

Fish pastes should be sterilised at 240° F. for both 3-oz. and 1½-oz. jars for a period of half an hour. Whether 220° F. for an hour would be sufficient is a question upon which we should prefer not to express a definite opinion, as much will depend on the previous history of the material; that is to say, the extent to which bacteria are present and also the particular nature of the bacteria. You could by experiment determine the efficacy of the sterilisation by incubation as described in previous issues of this journal.

The object of sterilisation is to kill undesirable bacteria which may be present. If a jar is heated just before sealing, most of the air is driven out and remains out if the jar is capped immediately. Of course, this helps to reduce the chance of contamination. It also ensures a hermetic seal, thus guarding against the possibilities of contamination after sealing.

As, however, some bacteria are able to exist in absence of air, it is obvious that merely extracting the air without killing bacteria by heat will not have any material effect on these. However much care is bestowed upon products before they are actually put into the glass jars, it is impossible to prevent some contamination, as the air carries bacteria to a greater or lesser extent, and then handling transfers germs to the product, so you will see that it is essential to have hygienic conditions even if the products are packed in cans. It is also essential to carry out the sterilising process in order to destroy by heat all bacteria which may be present in the raw materials.

The application of sterilisation after spoilage has set in would not cure it; sterilisation is applied to prevent spoilage, not to cure it.

With regard to question four, you would run a risk of being prosecuted if you included more than 4 to 5 per cent. of starch filler in your pastes. One way of avoiding this difficulty is to use instead of starch a certain amount of cheap meat, but we do not think that any public health authority would take objection to the presence of, say, not more than 4 per cent. starch, as some filler is really necessary for the production of a satisfactory paste. Technically, a filler may be anything—water, flour, fat, or grease—other than what the paste is stated to consist of. For example, if it is a salmon and shrimp paste, anything in the paste other than actual salmon and shrimp meat is filler, and the same applies to bloater paste. The most commonly used filler, of course, is starch.

1,410. *I am having difficulty in obtaining a clear jelly in chicken meat packed in cans. I use the broth from cooking, with added gelatine, and find a grey sediment at the bottom of the cans after sterilising.* (Lancashire.)

It is difficult to make any definite suggestion without knowing full particulars of your operations. We might suggest in a general way that you try clearing the liquid by the addition of either isinglass or egg albumen.

On the other hand, the trouble may be due to the use of a hard water.

Boston Cream.

1,411. *Kindly supply formulæ for a sherbet powder, health salts, and Boston cream.* (Glasgow.)

The best formulæ are given in Scarborough's book on *Sweet Manufacture*, which we are publishing.

The following example from another source is for a medium sherbet powder:

Tartaric acid	5 lb.
Bicarbonate of soda	6 ,,
Sugar	28 ,,
Oil of lemon	1½ oz.
One or two drops otto of rose.	

It is important to have each ingredient thoroughly dry before mixing. The flavour should be well mixed with part of the sugar, passed through a fine sieve, and mixed with the rest.

With regard to health salts, a good account of these, together with formulæ, was given in an article which appeared in our associated journal *The Manufacturing Chemist*, the March issue.

Boston cream is made up from cornflour and water (about 1 lb. of the former to 1 gallon of water). This is boiled to a light gel and cooled. Margarine and glucose are added, and the mixture worked up to a stiff cream in a powerful mixing machine.

Mould on Lemon Curd.

1,412. [*A reader asks for information on the U.S.A. regulations with regard to the use of rum and brandy in marmalades and mincemeat. Also if these have a preservative action. He then proceeds as follows*]:

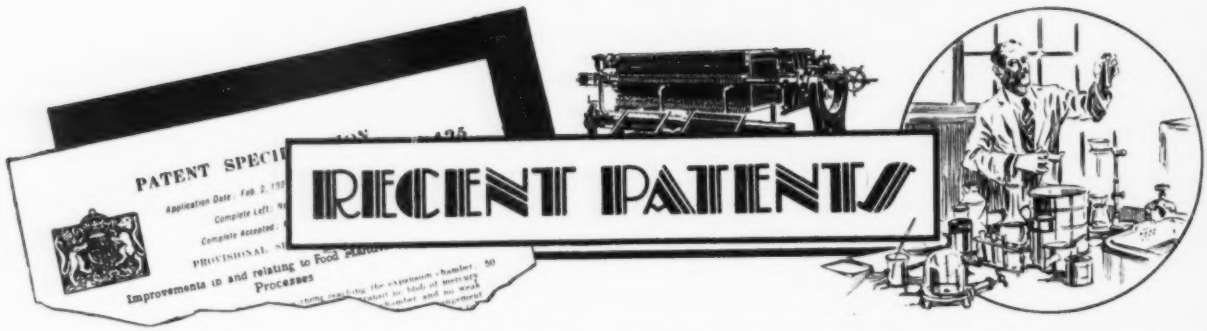
We should like to take this opportunity of telling you what an extremely valuable mine of information we find FOOD MANUFACTURE, *and how thankful we are that we happened to wander past your stand at the Imperial Fruit Show at Manchester in the autumn of 1931.*

We have had several occasions to write to you concerning the cause of mould on lemon curd and other preserves, and although we have faithfully carried out your instructions with regard to perfect cleanliness and drying of all utensils, etc., and the use of glycerine for wiping round necks of jars, the trouble still continued, and we think you may be interested to know that we have finally located the cause of the trouble; namely, cardboard wads (sample enclosed). Whether these wads are used in conjunction with metal caps or parchment caps, the result after a certain lapse of time is always the same; namely, a mould growth starting on the wad. A few days ago we bought a jar of apricot jam and marmalade sealed with a cardboard wad and parchment. On opening it we were very interested to find the growth of mould that we are now so familiar with. Also a few months ago a local shop was making a great display of a grape fruit marmalade packed in the jars we use, with cardboard wads and metal caps. The last time we had occasion to visit that shop we noticed that not one jar of the marmalade was on show, and we have wondered if the growth of mould has killed the repeat trade.

We hope we have not wearied you with this, but we think it is a cause of mould that ought to be recognised. (England.)

As regards the mould, we can well understand that you had trouble with these cardboard wads, as they are porous and will absorb moisture, together with a certain percentage of sugar, and this will, of course, form an ideal ground for breeding mould. If you are using wads, they should be waxed, so as to be rendered quite non-porous and resistant to the penetration of the moisture. In our opinion, such wads should not be used at all. You should have either a waxed paper or some form of liner which is absolutely non-porous and will resist the penetration of moisture.

We understand that if more than 4 per cent. of alcohol is present in marmalade or mincemeat, duty will be charged, and the percentage of alcohol must be declared. The presence of spirits will certainly be effective in preventing a tendency to fermentation. However, you should communicate with the American Trade Commission in London for information on duties and similar questions.



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Latest Patent Applications

18211. BEISSER, C.: Devices for automatically indicating weight of pickling-brine for meat. June 26.

18314. HILL, E. B.: Food preparations. June 27.

18191. LINLEY, J. A.: Treating meat. June 26.

18246. NEALE, H. A.: Preparation of tablets of coffee, etc. June 27.

18207. PONSFORD, G. L.: Preservation of goods in sealed containers. June 26.

Specifications Published

394,314. M. AND R. DIETETIC LABORATORIES, INC.: Treatment of liquid milk products and other phosphate containing aqueous solutions.

394,409. CHORLTON, F. O. L.: Machine for filling bottles, jars, or other suitable containers, with plastic or semi-plastic material, under the control of an induced vacuum.

394,489. CERF, H. LE.: Moulding of plastic substances such as confectionery.

394,498. TEATINI, D.: Process for purifying sugar factory and refinery juices.

394,621. DYCKERHOFF, DR. H.: Treatment of coffee beans.

Printed copies of the full Published Specifications may be obtained from the Patent Office, 25, Southampton Buildings, London, W.C. 2, at the uniform price of 1s. each.

Abstracts Published

Group Abridgments can be obtained from the Patent Office, 25, Southampton Buildings, London, W.C. 2, either sheet by sheet as issued on payment of a subscription of 5s. per group volume, or in bound volumes price 2s. each.

390,801. **Cocoa manufacture.** BÜHLER, GEB, Uzwil, Switzerland. Cocoa powder of an attractive dark colour is produced by heating and cooling the stock, the heating being carried out prior to grinding and the cooling during grinding, or the heating being carried out during grinding and the cooling after grinding.

389,389. **Food fats.** JACKSON, L. MELLERSH, 28, Southampton Buildings, London (Swift and Co., Union Stock Yards, Chicago, U.S.A.).
Shortening-agents—*e.g.*, hog lard, hydrogenised hog lard, mixed oils and stearine, and hydrogenised vegetable oils—are improved in creaming and other qualities by rapidly super-cooling the melted shortening to such an extent that the heat of crystallisation will not quite raise the temperature to the normal congealing point, withdrawing before any appreciable crystallisation has taken place, and permitting it to crystallise. For example, lard is melted at 120° F., passed rapidly through an internally cooled chilling machine to a temperature of 65° F. or lower, and filled into containers in which it is allowed to set.

Recent Trade Marks

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SANAMEAT.—538,658. **A vegetable food preparation known as nut-meat.** GRANOSE FOODS, LIMITED, Stanborough Park, Watford, Hertfordshire. July 5.

JOKER.—539,470. **Chocolate.** GEORGE PAYNE AND COMPANY, LIMITED, 21 to 24, Queen Elizabeth Street, Tower Bridge, London, S.E. 1. July 5.

VITAFRUTES.—539,932. **Canned fruits.** VITACREAM, LIMITED, 48, Mark Lane, London, E.C. 3. July 5. (By Consent.)

DISTO.—540,877. **Tea.** S. J. PALMER AND COMPANY, LIMITED, St. Crispin's Buildings, Low Friar Lane, Newcastle-upon-Tyne, 1. July 5.

PRIMULA.—540,921. **Fruits and vegetable (for food).** JOHN ERNEST THOMAS, trading as G. F. Hayward and Co., 18, Mathew Street, Liverpool. July 5. (Associated.)

McDOUGALL'S.—541,319. **Self-raising flour.** MCDOUGALL'S, LIMITED, Wheatsheaf Mills, Millwall Docks, London, E. 14. July 5. (Associated.) Advertised before acceptance, the applicants alleging distinctiveness.

LOOPOROO.—541,836. **Substances used as food or ingredients in food.** CARR AND COMPANY, LIMITED, 54, Church Street, Carlisle, Cumberland. July 5.

JESTER.—538,516. **Vegetables (for food), fish, meats, soups, sauces, cereals (for food), pulses (for food), game (for food), and poultry (for food).** BRITISH CANNERS, LIMITED, Drayton House, Euston Road, London, W.C. 1. June 28. (Associated.)

HALIBOL.—540,920. **Substances used as food or as ingredients in food.** ALLEN AND HANBURYS, LIMITED, Plough Court, 37, Lombard Street, London, E.C. 3. June 28. (Associated.)

POMPADOUR.—539,560. **Preparations for making beverages.** The Firm trading as R. SELLIG AND HILLE, 27, Zwickauerstrasse, Dresden-A. 24, Germany. June 28. (Associated.)

GLENMAE.—540,812. **Substances used as food or as ingredients in food, but not including margarine or cheese and not including any goods of a like kind to any of these excluded goods.** NICHOLAS GORDON PINNOCK, trading as Gordon Pinnock and Company, Grecian Chambers, 57a, Dale Street, Liverpool. June 28.

KING KADE.—541,125. **Preparations for making beverages; and beverages (not alcoholic, not aerated, and not medicated).** NEWBALL AND MASON, LIMITED, 90, Beech Avenue, New Basford, Nottingham. June 28.